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BLISTER RUST WORK IN THE FAR WEST

.

January 1 to December 31, 1924.



Spokane Branch
Office of Blister Rust Control,
618 Realty Building,
Spokane, Washington.



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INTRODUCTION

Blister rust was found for the first time in the West at Vancouver, B. C., in the autumn of 1921. The work of this Office during 1922 consisted largely of scouting for the limits of infection of the disease, and the eradication of the cultivated black currant. During that season it was found that the disease had spread quite generally over the Puget Sound region, and as far south as the Columbia River. A secondary and geographically separate focus of infection was found to exist in eastern British Columbia, from Sicamous and Canoe eastward to Revelstoke and Beaton.

The season of 1923 was notable principally for the spread of infection southward through the dry belt of central British Columbia and through the lake region of eastern British Columbia. Infection on cultivated black currants was found to be generally scattered over the dry belt, and extended as far south as the central part of Okanogan County, Washington. Infection in eastern British Columbia was found to have extended southward to Grand Forks, British Columbia, Danville, Ferry County, Washington, and to Nelson, British Columbia.

It was also found that numerous Ribes were each year infected in the Puget Sound region of western Washington. Their proximity to native white pines made it probable that these pines were becoming infected.

In general, at the end of the 1923 field season, the Idaho white pine belt was directly threatened with invasion from the northwest, through the dry belt, and from the north, through Nelson, British Columbia, and nearby points. Also, the increase of infection in western Washington constituted an ever-increasing menace of infection in western Oregon.

The program for the western work which has been promulgated to meet existent conditions at the beginning of the 1923 season consisted briefly of the following: (1) delay of the rapid spread of the disease by, eradication of the cultivated black currants, and strict enforcement of blister rust quarantines, and (2) development of local control methods suitable to western forest conditions. The spread of the disease toward the Idaho white pine belt during 1923 emphasized the necessity of vigorous prosecution of this general program.

The activities of this Office during the season of 1924 have been conducted in conformity with the 10 year program formulated by the Executive Committee. Cultivated black current eradication, quarantine enforcement, experimental local control and educational work have been carried on.

Work during the period December 1, 1923 to June 30, 1924 was conducted under the Federal Appropriation of \$50,000. for western blister rust control during the fiscal year 1924. An additional \$4,500. constituting the Departmental reserve on the entire blister rust appropriation, was secured for use during May and June, 1924, in order to institute field work on a basis commensurate with that after July 1. Work during the period July 1 to December 31, 1924 was conducted under the Federal Appropriation of \$125,000 for western blister rust control for the fiscal year 1925. These appropriations

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both carry items for scientific investigation of the disease under western conditions. This work has been conducted by the Office of Forest Pathology, Bureau of Plant Industry, and will be reported upon by that Office.

The two appropriations under which the work covered in this report was conducted were allotted by the Secretary of Agriculture as follows:

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Allotment of Funds, Fiscal year 1924.

the first of the transfer of the same to t	200 000 000	riation for April 1	Period July 1923 to Jun	
Project	to Jur	ne 30, 1923.	1924.	Total
1. Scientific investigation of the		200		
disease by Office of Forest Pathology	-//	, -	4.0	
and establishment of a control demon-		46-		
stration area at Cheekye, British Colum	nbia.	\$13,700.00	\$7,100.00	\$20,800.00
2. Location and eradication of cultivat				
for the disease, and educational work.		11,700.00	17,400.00	29,100.00
3. Control reconnaissance and experiment local control, in the white pine forest of northeastern Washington, northern				
Idaho, and northwestern Montana.	16.	4,700.00	7,600.00	12,300.00
4. Inspection of nursery shipments for violations of blister rust quarantines	in	5. 3 mg	ioi	
cooperation with Federal Horticultural	Board.	7,095.00	7,800.00	14,895.00
5. For general supervision of field work, and miscellaneous expenses of				*
western field office. Total	www.d	\$40,590.00	8,600,00 \$48,500,00	\$89,090.00
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Allotment of Funds, Fiscal Year 1925.

1. For application of general control measures to delay the spread of the rust including location and eradi-	to June 30,1925.
cation of cultivated black currents, blister rust quarantine inspection work, nursery sanitation, etc.	\$35,815.00
2. For development of local control practices by testing and improving methods of control reconnaissance, the physical and chemical destruction of Ribes and determining the ecological factors effecting local control	20,603.00
3. For application of local control including control reconn-	
aissance and eradication of Ribes on Federal lands.	33,649.00
4. For field studies and collection of field data on spread of rust, damage to pine, etc.	6,695.00

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Allotment of Funds, Fiscal year 1924.

	Period July 1923 to June	vol moitsing	
Tetol	1924.	ne 30, 1923.	Project 1. Scientific investigation of the disease by Office of Forest Pathology and establishment of a control demon-
00.008.08\$	\$7,100.00	\$13,700.00	
29,100.00	17,400.00	11,700.00	2. Location and eradication of cultivated black currents, nursery inspection, scouting for the disease, and educational work.
12,300.00	7,600.00	00.007 _e &	5. Control reconnaissance and experimental local control, in the white pine forests of northeastern Washington, northern Idaho, and northwestern Montana.
14,895,00	7,800.00	7,095,00	4. Inspection of nursery shipments for violations of blister rust quarentines in cooperation with rederal Horticultural Board.
11,595,00	8_600.00 \$48,500.00	3,595.00 (40,590.00	5. For general supervision of field work, and miscellaneous expenses of vestern field office. Total

Allotment of Funds. Fiscal Year 1925.

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\$55,815.00	1. For application of general control measures to delay the spread of the rust including location and eradication of cultivated black currants, blister rust quarentine inspection work, nursery sanitation, etc.
20,603,00	2. For development of local control practices by testing and improving methods of control reconnaissance, the physical and chemical destruction of Ribes and determining the ecological factors effecting local control
\$\$ _* 649.00	5. For application of local control including control reconnaissance and eradication of Ribes on Federal lands.
6,695.00	4. For field studies and collection of field data on spread of rust, damage to pine, etc.

5. For scientific investigation of the behavior of the rust under western conditions.

\$12,000.00

6. For miscellaneous expenses, including supervision, supplies, clerical assistance, etc.

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12,488,00

7. For reserve

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3.750.00 \$125,000.00

In order to budget the funds for the western work on a more detailed basis, the allotment for the fiscal year 1925 was expanded into a detailed statement of the use to which these funds should be put. As it is hoped to use these projects and subprojects on a permanent basis in the future. The work covered in this report will follow the outline of this detailed allotment, which follows:

FOR APPLICATION OF GENERAL CONTROL MEASURES TO DELAY THE SPREAD OF THE RUST INCLUDING LOCATION AND ERADICATION OF CULTIVATED BLACK CURRANTS. BLISTER RUST QUARANTINE IN-SPECTION WORK. NURSERY SANITATION. ETC.

This project constitutes the emergency phase of the western blister rust control program. Its purpose is to secure the delay of the spread of the rust. to gain time for the development of local control practices, and to postpone as long as possible damage by the rust to western pine forests.

1.1 Cultivated black current location and eradication in cooperation with states.

In conformity with the general program, field work was conducted to secure the eradication of cultivated black currents over additional territory in Montana, Idaho, Washington, Oregon and California. In general, a more tensive method of work was adopted than had been used in the past. The work was organized on a county basis, and included a preliminary survey securing all possible information from county officials on type of country, roads, and location of houses. Maps of each county were procured, the location of all houses marked, and themen were instructed to visit each house. At the same time. educational work was conducted in each county, by means of moving pictures, exhibits, and local newspaper articles, which proved to be of great assistance in securing the desired eradications.

While these general methods were established and used in the field, it was necessary to modify them in the several states to conform with variations in working conditions. The State of Idaho has legislation against the cultivated black current, during the period covered by this report had funds available to assist in the work, and paid compensation for plants destroyed. Oregon has legislation against the cultivated black current but no funds available for compensation. In Montana and California, altho there are no laws against the cultivated black current, the eradication work has had the

5. For scientific investigation of the behavior of the

6. For miscellaneous expenses, including supervision, supplies, clerical assistance, etc. 12.468.00

7. For reserve

Total \$125,000.00

\$12,000.00

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PROJECT 1.

FOR APPLICATION OF GRUERAL CONTROL MEASURES TO DELAY THE SPEECE OF THE RUST INCLUDING LOCATION AND MEADICATION OF CULTIVATED BLACK GUREANTS, BLISTER BUST QUARANTINE INSPECTION TORK, BURSTEY SAVITATION, ETC.

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full sympathy and much material assistance from the state departments of agriculture. The eradication work conducted by this Office in Washington has had the assistance of a number of the field employees of the State Department of Agriculture.

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1.11 Cultivated black current eradication in Montana.

All cultivated black current eradication and educational blister rust work in Montana is carried on by Mr. C. H. Johnson, under terms of the following cooperative agreement:

MEMORANDUM OF UNDERSTANDING BETWEEN THE MONTANA STATE DEPARTMENT OF AGRICULTURE AND THE BUREAU OF PLANT INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE, RELATIVE TO COOPERATIVE WORK ON THE CONTROL OF WHITE PINE BLISTER RUST IN MONTANA.

EFFECTIVE JULY 1st. 1924 to JUNE 30th. 1925.

The object of this memorandum of understanding shall be to facilitate the prompt location and eradication or effective control of white pine blister rust in Montana in view of the threatened destruction of private, state and nationally owned timber throughout the West as a result of the presence of this disease in British Columbia and Washington, and the danger of its further spread by natural dissemination or quarantine violations.

It is agreed that the Montana State Department of Agriculture and the Bureau of Plant Industry shall cooperate to the above ends in accordance with the following plans:

- l. The Bureau of Plant Industry shall pay the salaries and expenses of one or more men who shall perform necessary scouting for the disease in Montana. The Montana State Department of Agriculture shall deputize these scouts to enable them to enter and inspect any property but not to destroy plants.
- 2. In view of the fact that the Montana State Department of Agriculture has no special appropriation for blister rust control, it is understood that when this disease appears in Montana, the Montana State Department of Agriculture agrees immediately to make every effort to secure funds for its eradication from sources available to it, and in the event of failure to secure necessary funds for this purpose, the Montana State Department of Agriculture shall deputize the employees of the Bureau of Plant Industry working in Montana, empowering them to destroy blister rust host plants infected or potentially infected with this disease.
 - 3. The Montana State Department of Agriculture and the Bureau of Plant Industry shall cooperate in inspection for the purpose of aiding in the enforcement of State or Bederal blister

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 - 5. The Montana State Department of Agriculture and the Bureau of Plant Industry shall cooperate in inspection for the purpose of aiding in the enforcement of State or Dederal blister

rust quarantines now in effect or which may be promulgated. The Bureau of Plant Industry shall pay the salaries and expenses and direct the work of one or more men who shall during the proper season inspect for violations of the Federal blister rust quarantines. These men shall also cooperate with the Montana State Department of Agriculture in enforcing State quarantines. For this purpose they shall receive instructions in methods of procedure from the Montana State Department of Agriculture, and shall be deputized to destroy plants shipped in violation of State quarantines.

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- 4. The Montana State Department of Agriculture and its cooperators shall use their regular employees, so far as their other duties permit, in systematically locating cultivated black currants and infected or potentially infected blister rust host plants; in scouting for the blister rust; in inspecting nurseries for this disease and in enforcing State and Federal blister rust quarantines. Such work will aggregate approximately 100 man days, representing a total expenditure on the part of the Montana State Department of Agriculture and its cooperators of about \$500.00 for the control of this disease. The expenditures of the Bureau of Plant Industry indicated in previous paragraphs will aggregate approximately \$7,000.00 but none of the Federal funds shall be spent in compensation for plants destroyed in control work.
 - 5. All official records showing work performed under this agreement shall be open to inspection of the Montana State Department of Agriculture or the Bureau of Plant Industry on request. All findings of the blister rust made by either the Montana State Department of Agriculture and its cooperators or the Bureau of Plant Industry shall be promptly reported to the other party. All specimens collected or received by the Montana State Department of Agriculture and its cooperators which are suspected to be infected with blister rust shall be submitted to the Bureau of Plant Industry for critical determination. The Bureau of Plant Industry shall give such technical information to the employees of the Montana State Department of Agriculture and its cooperators as will enable them to recognize the several stages of the disease.
- 6. It is understood that the Bureau of Plant Industry shall be primarily responsible for scouting and location of the blister rust in Montanan and for technical information on its control, but that the Federal government has no authority to destroy private or state property and therefore the Montana State Department of Agriculture shall be wholly responsible for the destruction of such pine, currant, and gooseberry plants as may be found necessary in order to control the spread of this disease in Montana, including plants shipped in violation of State and Federal blister rust quarantine regulations.

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7. This memorandum of understanding shall take effect July 1. 1924 and continue in force until June 30, 1925 or until previously terminated by mutual consent of the parties concerned.

SIGNATURES:

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Aug.20, 1924	(s.) Chester C. Davis
Date	Commissioner of Agriculture, Montana
TEST TO THE TOTAL TOTAL	State Department of Agriculture.
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Date

Mr. Johnson is headquartered at Hissoula, in the office of Mr. W. L. Showell, Chief, Division of Horticulture, State Department of Agriculture, from whom he receives much valuable assistance in planning and carrying out his work. The following report by Mr. Johnson covers all his activities for the period of this report:

Report of Seasons Work in Montana for 1924.

The Blister Rust work was resumed in Montana on May 1st by way of a school campaign conducted as in the past to make known the facts concerning blister rust and to aid in our ever increasing efforts to destroy the cultivated black currents.

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The accompanying table shows the results of this work by counties.

			TH	.DI	T Git		Trail at 1		ş.
	:	No. of Tea	chers	:1	To. who	:No.	of Spec	imer	s: Reported Locations
County	9 2	Who Recei	ved	:1	Reporte	d:	Sent in	1	: of
20000		Literatu	re	:		:			: Black Currents
Lewis & Clark	2 \$, 168	,	:	60	:_	10		: 1
	z	,v	- 5	:		2	-		:
Madison	z	80	10.5	:	26	2,	5		: 0
		1	5 6	2	100	2	- 1		:
Teton	2	83		3	22	2 /	0		: 0
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	:		.n.g	:		2-			•
Beaverhead	:	. 78	1.	\$	32	:	7	*	: 0
		3 4	0	:	+36		0.0	4	•
Glacier		57			18	:	3		: 0
	. :		ų	2	59.45	1			3 4
Jefferson	ž. 2	. 58			24		2		: 0
TAR NO.	8 \$:		2			•
Pondera	:	68		:	36	1	4		: 0
Total	:	592	ALCO.	:	218	:	31		: 1

The number of teachers replying to our circular letters is quite satisfactory considering the fact that in most high schools the work is usually turned over to the science teachers. In consolidated schools one teacher sometimes makes a report for the entire school.

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SIGNATURES:

(s.) Chester C. Davis	Aug.20, 1924
Commissioner of Agriculture, Montana	ejsī
State Department of Agriculture.	

Oct.18,1924 (s.) W. A. Taylor
Date

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The secompanying table shows the results of this work by counties.

TABLE I

County	: Who Received	A:	droge	:pe	Gent in	:	20
	: Literature	n d		2		:	Luck Gurrants
iewis & Clark	: 168	:	60	:	10	:	Σ
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	3	1		\$		4	
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cadera	39 ;	4	36		Δ	•	0
Esto	: 592	and arm	218		ra	The same of the same	m-manuscript or many construction

The number of teachers replying to our circular letters is quite satisfactory considering the fact that in most high schools the work is usually turned over to the science teachers. In consolidated schools one teacher sometimes makes a report for the entire school.

Four men with two machines were engaged in the location and eradication of black currents. The number of bushes found this season shows a marked falling off when compared with the previous seasons record. This can best be explained by the facts that the chief industries in counties just east of the continental divide are mining and grazing and little attempt is made at fruit growing. This does not however, explain the almost total absence of the cultivated black currants because, red and white currants and cultivated gooseberry bushes are quite common. The chief reason for the almost nonexistence of black currents is that they are not as hardy as the other species of currants and gooseberries and are not able to withstand the severe winter freezing and summer droughts which they are subjected to in that portion of Montana east of the mountains. If such were not the case black currents would be more numerous.

In my daily quest for information I always asked each farmer if he had or knew of anyone possessing black currents. The answer was almost invariably, "I had some. They did not do well, so I dug them up." Another reason why the black currants are losing prestige is that the younger generation have not developed the same fondness for the fruit as their parents. The medicinal benefits seem to be losing favor and the disagreeable odor which is so often described is another factor working to their disfavor.

The state of the s The following table shows the status of black current eradication to November 30. 1924. TABLE, II

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County	:	Erad	ica	ted	:1	Tot	Era	dic	ated:		Tot	al		:%	Plan	tings
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Ravalli,	\$	99	_:	703	2.	" y 3."	7	:	. 164:	106	5 in a	:	867	3	93	\$c
Flathead	\$.	46	1 2.	205		2 1	1,6	\$ 7	15:	1 47	W.		220	2	98	
Lake	:	29	:	160	:		3	:	28:	32	2	:	188	:	91	
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Silver Bow	: 9	14	:	44		orl#	3.	:	17:	17	di.	:	61	:	83	**5
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Deer Lodge	:	1	2	2	:	U.B.	- E	F \$:	e bes	L 6.0.	:	. 2	:	100	
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Pondera	:	1	3.3.2	4 4	:		1 :	:	2:	115 6	2	:	6	: "	50	
Madison	:	11	:	19	:	W 2	*** 7 -	- 2	. že 📜 🙎	6,0 13	L	:	, 19	:	100	
Beaverhead	:	3	:	19	2		1	*	2:	4	Ļ	:	21	:	75	
Glacier	:	1	:	3	:		Arma	:	- :	J		:	3	2	100	
Jefferson	:1	~ 3	. 1	28	:	130	2	:	133:	110	5	:	161	: 1	1 60	
Total	:	363		2489	:		36	:	824:	399)	:	3313	:	90.2	

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The following table shows the status of black current eradication to Movember 30, 1924.

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County	The analysis of the second	Erad	soi	bet	joM:	Fire	ed.ice	; beti	oT	Let		6:	Plantings			
3-2000	[q:	Plantings: Plants: Plantings: Plants: Fl									edma.Eq	lants: Eradicated				
Missoula	2	81		524	2	15	5	449:	96	2	973		84			
Ravalli	n 9	66	4 9	703	:	2	2	164:	106	#	867	*	93			
Flathead	:	46	5	205	:	I	3	15:	4.7	:	220	2	98			
Lake	3	29	1	160	:	2	:	:88	SW	:	188	:	16			
Mineral	7	8	*	59	3	100	:	th qua	8	*	29	:	1.00			
Lincoln	3	IG	3 4	121	2	90-th	:	d ma	1.6		ISI	:	100			
Sanders	*	5	2	56	2	week	:	3	6	9	56	1	100			
Silver Bow	2	14	2	44	:	5	2	17:	7.7	:	61		85			
Powell	- 2	Le	:	73	:	conti	:	:	6.	:	73	:	100			
Granite	2	I	3	3		pout		2 000	1	:	3	:	001			
Deer Lodge	2	1	:	S	*	Speed	2	3 200	1	2	S	:	100			
Lewis & Clark	1	88	u .	436		3	2	14:	SL	2	450	:	90			
Teton	0	5	2	50	3	-	ès 10	2	5	2	50	**	IOO			
Pondera		I	3	4	:	I	1	:\$	2	2	9	:	50			
Madison	2	II		19	:	Meet	:	3	11	I	19	:	100			
Beaverhead	*	3	*	19	2	I	2	:\$	4	*	RI		75			
Glacier	2	I		5		448	:		I	*	3	2	TOO			
Jefferson		3	3	28	:	S	:	153:	5	3	161		00			
LetoT	2	565	1	2489		36	2	824:	399	:	3313	:	\$.08			

The two reel blister rust film, "A Menace to Western Timber" has proved to be a very popular adjunct in aiding our eradication work, also proving to be of exceptional educational value probably more so than any other plan we have used in bringing our problem before the public.

The following figures give the attendance for the towns in which the blister rust film has been shown.

Town		Attendance
Dillon	007.74	775
Sheridan		200
Basin	Q ₁	200
Boulder	, Kon	175
Helena	21	1810
E. Helèna	, ,	210
Conrad		350
Choteau	, = e	250
Missoula		1700
	Total	5670

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Exhibits were placed at the state and several county fairs in western Montana. These displays showed the stages of the blister rust at it appears on Ribes and white pine. Many people who formerly had black currants were attracted by the exhibit and for the first time clearly understood why it was necessary too sacrifice their bushes. A man was continually on the job to explain blister rust, supply general information and distribute bulletins and circulars covering the disease in detail.

It was particularly interesting to notice how familiar the children were with the blister rust. As soon as they saw the sign it seemed to associate what they had previously learned from their teacher about this disease. They seemed to be very keen on the subject and eagerly sought for information.

An experience will further illustrate how well the blister rust has been advertised in Montana. One day I had the occasion to consult a photographer, mechanical engineer and moving picture manager on matters pertaining to an exhibit, three men holding positions in different walks of life. When I mentioned the word blister rust they immediately began to ask me questions and they were presented in such a manner that I knew it was not the first time they had heard of the subject. I was quite astonished, but elated to learn that these men knew something of a subject far removed from their lines of work. I asked each individual where he had ever heard of the blister rust. The replies were, from his children, another through the papers and evidently saw our film, while one party had seen the disease in the eastern part of the United States.

The new charts recently received together with the material I now have available will add to the attractiveness of fairs in the future and having these exhibits in such compact form will enable me to cover more territory. I have recently placed a blister rust exhibit before a class in entomology at the University and have made arrangements to loan this exhibit to the Botany Department to be used for class work.

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944	Dillon	
200	Sheridan	
200	Dasin	
175	Boulder	
1810	Helena	
210	D. Melena	
550	Conrad	
250	Chotesn	
1700	Hissoula	
5670	Total	

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The following figures give the attendance visiting the blister rust exhibit at the fairs:

Helena (State Fair) 10,000
Missoula (Western Mont. Fair) 4,600
Ravalli (County Fair) 5,100
Total 19,700

During the months of October and November some scouting was done in northwestern Montana and along the Canadian border. Considerable scouting was done on the wild species of currants and gooseberries along the Kootenai, Stillwater, Flathead, Clarksfork, Thompson and Missoula river.

A total of 3815 <u>G. setosa</u>, 1609 <u>R. americana</u> and 900 <u>R. petiolare</u>, 680 cultivated gooseberry bushes were inspected.

1.12 Cultivated black current eradication in Idaho.

Cultivated black current eradication in Idaho was conducted under the immediate supervision of Dr. H. Schmitz, School of Forestry, University of Idaho, Moscow, Idaho, Dr. Schmitz's report to this Office on the work of the past year, including the cooperative agreement under which the work was done, is given below:

Report of Work Done in the State of Idaho During the Field Season of 1924 in Connection with the Cultivated Black Currant Eradication.

As in past years, cultivated black current eradication, scouting for the disease and educational work was carried on in Idaho under the terms of the following tentative agreement, between several cooperating agencies:

MEMORANDUM OF UNDERSTANDING BETWEEN THE IDAHO STATE DEPARTMENT OF AGRICULTURE, THE UNIVERSITY OF IDAHO, THE STATE BOARD
OF LAND COMMISSIONERS, THE NORTH IDAHO FORESTRY ASSOCIATION,
THE POTLATCH TIMBER PROTECTIVE ASSOCIATION, THE CLEARWATER
TIMBER PROTECTIVE ASSOCIATION, THE COEUR D'ALENE TIMBER PROTECTIVE ASSOCIATION, THE PEND OREILLE TIMBER PROTECTIVE
ASSOCIATION, THE PRIEST LAKE TIMBER PROTECTIVE ASSOCIATION
AND THE BUREAU OF PLANT INDUSTRY OF THE UNITED STATES DEPARTMENT OF AGRICULTURE, RELATIVE TO COOPERATIVE WORK ON THE CONTROL OF WHITE PINE BLISTER RUST IN IDAHO.

EFFECTIVE MAY1, 1924 to JUNE 30, 1925.

The object of this memorandum of understanding shall be to facilitate the prompt location and eradication and effective control of white pine blister rust in Idaho, in view of the threatened destruction of private, state and nationally owned timber throughout the West as a result of the presence of this disease in British Columbia and Washington, and the danger of its further spread by natural dissemination or quarantine violations.

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MINORANDUM OF UNIVESTANDING BETWENN THE IDAHO STATE DEPARTMENT OF AGRICULTURE, THE UNIVERSITY OF IDAHO, THE STATE BOARD OF LAND SOMNISSIONERS, THE TORTH IDAHO FORESERY ASSOCIATION, THE POTLATCH TIMES PROTECTIVE ASSOCIATION, THE COUNTY OF ALIGHE TIMEST THE FROM A TOCKETION, THE PHYD ORBITLE TIMEST PROTECTIVE ASSOCIATION AND THE PRIME TIMEST PROTECTIVE ASSOCIATION AND THE BURLEY INJUSTRY OF THE UNITED STATES DIFFERMINT OF AGRICULTURE, RELATIVE TO COOPERATIVE TORN OF THE CONTROL OF THE THIRD STATES DIFFERMINT OF AGRICULTURE, RELATIVE TO COOPERATIVE TORN OF THE CONTROL OF THE FIRST BUSTER HUST IN TORNO.

HEFFOUR MAYL, 1924 to JUNE 50, 1925.

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It is agreed that the Idaho State Department of Agriculture, the University of Idaho, the State Poard of Land Commissioners, the North Idaho Forestry Association, the rotlatch Timber Protective Association, the Clearwater Timber Protective Association, the Coeur d'Alene Timber Protective Association, the Pend Oreille Timber Protective Association and the Priest Lake Timber Protective Association, parties of the first part, and the Bureau of Plant Industry, United States Department of Agriculture, party of the second part, shall cooperate to the above ends in accordance with the following plan:

- of Plant Industry, U. S. Department of Agriculture, shall cooperate in inspection for the purpose of aiding in the enforcement of state and federal blister rust quarantines now in effect or which may be promulgated. The Bureau of Plant Industry, U. S. Department of Agriculture, shall pay the salaries and expenses and direct the work of one or more men who shall, during the proper season, inspect plant shipments for blister rust infection and shall report to the proper authorities all violations of blister rust quarantines as found. For this purpose they will receive instructions in methods of procedure from the Idaho State Department of Agriculture and shall be deputized to destroy plants shipped in violation of State quarantines.
- 2. The Bureau of Plant Industry, U. S. Department of Agriculture, and the Idaho State Department of Agriculture shall cooperate
 for the field season of 1924 in the paying of the salaries and
 expenses of six men as scouts who shall do the necessary scouting for
 the disease and the locating of cultivated black currants in Idaho.
- 3. The Idaho State Department of Agriculture agrees to deputize the scouts mentioned in Section 2 and will invest them with the necessary authority to destroy cultivated black currants as provided in Chapter No. 70. Idaho Session Laws of 1923. Furthermore, the Idaho State Department of Agriculture agrees to reimburse such owners of cultivated black currants from monies provided for this purpose. The Idaho State Department of Agriculture also agrees to pay the salaries and expenses of the scouts mentioned in Section 2 for the period May 15th to June 30th, 1924. Furthermore, the Idaho State Department of Agriculture agrees to pay the cost necessary for stenographic help for the field season of 1924, and still further the Idaho State Department of Agriculture agrees to furnish three Ford touring cars and to maintain them during the period of May 15 to June 30, 1924. After June 30. 1924, the State Department of Agriculture agrees to rent said cars for a consideration of \$50.00 per car per month to the Bureau of Plant Industry, U. S. Department of Agriculture, until the completion of the field work on white pine blister rust control for the year 1924. The Idaho State Department of Agriculture agreeing to pay all proper costs of maintenance of such cars except charges for gasoline, oil and storage, which will be paid by the Bureau of Plant Industry, U. S. Department of Agriculture. The Idaho State Department of Agriculture further agrees to pay the cost of printing such placards, posters or cards as

- It is agreed that the idaho State Separtment of Agriculture, the University of Idaho, the State Mard of Land Commissioners, the Morth Idaho Forestry association, the rotlatch Timber Protective Association, the Clearwater Timber Protective Association, the Pend Oreille Timber Protective Association, the Pend Oreille Timber Protective Association and the Priest Lake Timber Protective Association, parties of the first part, and the Bureau of Plant Industry, United States Department of Agriculture, party of the second part, shall croperate to the above ends in accordance with the following plan:
- 1. The Idaho State Department of Agriculture and the Bureau of Plant Industry, U. S. Department of Agriculture, shall cooperate in inspection for the purpose of siding in the enforcement of state and federal blister rust quarantines now in offect or which may be promulgated. The Bureau of Plant Industry, U. S. Department of Agriculture, shall pay the salaries and expenses and direct the work of one or more men who shall, during the proper season, inspect plant shipments for blister rust infection and shall report to the proper authorities all violations of blister rust quarentines as found. For this purpose they will receive instructions in methods of procedure from the Idaho State Department of Agriculture and shall be deputized to destroy plants shipped in violation of State quarentinos.
 - 2. The Bureau of Plant Industry, U. S. Department of Agriculture, and the Idaho State Department of Agriculture shall cooperate for the field season of 1924 in the paying of the salaries and expenses of six men as scouts who shall do the necessary scouting for the disease and the locating of cultivated black currents in Idaho.
- 5. The Idaho State Department of Agriculture agrees to deputize the scouts mentioned in Section 2 and will invest them with the necessary authority to destroy cultivated black currents as provided in Chapter No. 70, Idaho Session Laws of 1925. Furthermore, the Idaho State Department of Agriculture agrees to reindurse such owners of oultivated black currents from monies provided for this purpose. Idaho State Department of Agriculture also agrees to pay the salaries and expenses of the scouts mentioned in Section 2 for the ported May 15th to June 50th, 1924. Furthermore, the Idaho State Department of Agriculture agrees to pay the cost necessary for stenographic help for the field season of 1924, and still further the Ideho State Department of Agriculture agrees to furnish three Ford touring cars and to maintain them during the puriod of May 15 to June 30, 1924. After June 30, 1924, the State Department of Agriculture agrees to rent said cars for a consideration of \$50.00 per car per month to the Bureau of Plant Industry, U. S. Department of Agriculture, until the completion of the field work on white pine blister rust control for the year 1924. The Idaho State Department of Agriculture agreeing to pay all proper costs of maintenance of such cars except charges for gusoline, oil and storage. which will be paid by the Burezu of Plant Industry, U. S. Department of Agriculture. The Idalo State Department of Agriculture further agrees to pay the cost of printing such placeris, posters or cards as

may be necessary in order to facilitate the work. The above work and cooperation will aggregate a total expenditure by the Idaho State Department of Agriculture of approximately \$4,200 for the control of this disease for the period covered by this agreement.

- 4. The Idaho State Department of Agriculture will use its regular employees, so far as their other duties permit, in systematically locating cultivated black currents and infected or potentially infected blister rust host plants; in scouting for the white pine blister rust; in inspecting nurseries for this disease and enforcing State and Federal blister rust quarantines.
- 5. The School of Forestry, University of Idaho, still recognizing the fact that white pine blister rust constitutes one of the most serious menaces to the future productive value of state, nationally, and privately owned timber lands, and that in order that the industry which it represents may be perpetuated, considers the question of the control of white pine blister rust as one of its major activities. The School of Forestry, University of Idaho, therefore agrees to detail Dr. Henry Schmitz to this work throughout the coming field season and to allow him sufficient time during the remainder of this year to supervise the work in general. The School of Forestry, University of Idaho, also agrees to furnish the necessary office space and equipment in its regular quarters for the proper carrying out of this work. The U. S. Bureau of Plant Industry shall take up all field expenses including transportation costs of Dr. Henry Schmitz while actually engaged with supervision of this work. It is understood that he will spend three months, entire time and will after September 15. supervise the work in a general way and when completed shall provide such reports, plans and details as may be called for by the Idaho State Department of Agriculture and by the Bureau of Plant Industry, U. S. Department of Agriculture. Furthermore, the School of Forestry, University of Idaho, in accordance with the recommendations made at the Portland Conference (1922) agrees to continue a study on the rate of growth of the western white pine remaining on areas after logging. The results obtained from this study during the field season of 1923 show a marked increase in the rate of growth of immature western white pine remaining after logging. It is hoped that the results of the study will eventually indicate the possibility of incurring an expenditure for the protection of second growth western, white pine against white pine blister rust. Mr. Harry I. Nettleton. and Mr. C. W. Watson with one assistant, will be engaged for three months on this work during the coming field season and it is planned to carry on this work for a sufficient number of years so that reliable data may be obtained. The work here outlined will aggregate a total expenditure on the part of the School of Forestry, University of Idaho. of approximately \$3,050 for the control and study of this disease for the period covered by this agreement.
 - 6. The Department of Plant Pathology of the University of Idaho Agricultural Experiment Station agrees to esxamine all specimens sus-

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may be necessary in order to facilitate the work. The above work and cooperation will aggregate a total expenditure by the Idaho State Department of Agriculture of approximately [4,200 for the control of this disease for the poriod covered by this agreement.

- 4. The Idaho State Department of Agriculture will use its regular employees, so far as their other duties permit, in systematically locating cultivated black currents and infected or potentially infected blister rust host plants; in scouting for the white pine blister rust; in inspecting nurseries for this disease and enforcing State and Federal blister rust quarantines.
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- 6. The Department of Plant Pathology of the University of Idaho Agricultural Experiment Station agrees to essamine all specimens suc-

pected of being infected with the white pine blister rust when sent in by the field scouts and others, to keep the necessary records of such collections. It is also agreed that all specimens which are suspected of being infected with the blister rust shall be submitted to the U. S. Bureau of Plant Industry for final determination. Such work will aggregate a total expenditure on the part of the Department of Plant Pathology of the University of Idaho Agricultural Experiment Station of approximately \$300 for the control of this disease for the period covered by this agreement.

- 7. The Extension Division of the University of Idaho College of Agriculture shall use its regular employees, in so far as their other duties may permit, in locating cultivated black currants and other infected or potentially infected blister rust host plants, and in giving publicity to the campaign to eradicate black currants and to other means for preventing the introduction and spread of white pine blister rust in Idaho.
- 8. The North Idaho Forestry Association, the Potlatch Timber Protective Association, the Clearwater Timber Protective Association, the Coeur d'Alene Timber Protective Association, and the Pend Oreille Timber Protective Association and the Priest Lake Timber Protective Association, shall use their regular employees and the employees of their constituent timber protective associations, in so far as their other duties will permit, in systematically locating cultivated black currants and the scouting for the blister rust, and in locating infected or potentially infected host plants. Such work will aggregate a total expenditure on the part of the North Idaho Forestry Association and its constituent timber protective associations of approximately \$11,500 for the control of this disease for the period of times covered by this agreement.
- 9. The U. S. Bureau of Plant Industry shall take up the salaries and expenses of the scouts mentioned in Section 2, after June 30, 1924. Furthermore, the U. S. Bureau of Plant Industry agrees to take up the expenses of Dr. Henry Schmitz for the entire field season. Still further the U. S. Bureau of Plant Industry agrees to pay rental for the three Ford touring cars after June 30, 1924, on the basis as outlined in Section 3. The U. S. Bureau of Plant Industry also agrees to furnish the scouts with exhibit material and blister rust literature to be distributed in connection with the scouting work. The expenditures of the U. S. Bureau of Plant Industry indicated in this and previous paragraphs will aggregate approximately \$7,000. Any expenditures by the Bureau of Plant Industry shall be made according to the fiscal regulations of the United States Department of Agriculture.
- 10. The State Board of Land Commissioners shall use their regular employees, so far as their other duties permit, in systematically locating cultivated black currents and infected blister rust host plants and in scouting for white pine blister rust.
- 11. All official records of the work performed under this agreement shall be open to inspection by any or all parties to this agreement. All

pected of being infected with the white pine blister rust when sent in by the field scouts and others, to keep the necessary records of such collections. It is also agreed that the specimens which are suspected of being infected with the blister rust shall be submitted to the U. S. Bureau of Plant Industry for final determination. Such work will aggregate a total expenditure on the part of the Department of Plant Pathology of the University of Idaho Agricultural Experiment Station of approximately 3500 for the control of this disease for the period covered by this agreement.

- 7. The Extension Division of the University of Idaho College of Agriculture shall use its regular employees, in so far as their other duties may permit, in locating cultivated black currents and other infected or potentially infected blister rust host plants, and in giving publicity to the campaign to eradicate black currents and to other means for preventing the introduction and spread of white pine blister rust in Idaho.
- B. The North Idaho Porestry Association, the Potlatch Timber Protective Association, the Clearwater Timber Protective Association, the Coeur d'Alene Timber Protective Association, and the Pend Oreille Timber Protective Association, and the employees of the Imber Protective Association, shall use their regular employees and the employees of their constituent timber protective associations, in so far as their other duties will permit, in systematically locating cultivated black currants and the scouting for the blister rust, and in locating infected or potentially infected host plants. Such work will asgregate a total expenditure on the part of the North Idaho Forestry Association and its constituent timber protective associations of approximately [11,500 for the control of this disease for the period of timber covered by this agreement.
- 9. The U. S. Burezu of Plant Industry shall take up the salaries and expenses of the scouts mentioned in Section 2, after June 50, 1924. Furthermore, the U. S. Burezu of Plant Industry agrees to take up the expenses of Dr. Henry Schmitz for the entire field season. Still further the U. S. Burezu of Plant Industry agrees to pay rental for the three Bord touring cars after June 50, 1924, on the basis as outlined in Section 5. The U. S. Burezu of Plant Industry also agrees to furnish the scouts with each with the scouting work. The expenditures to be distributed in connection with the scouting work. The expenditures of the U. S. Bureau of Plant Industry indicated in this and previous paragraphs will aggregate approximately 37,000. Any expenditures by the Bureau of Plant Industry shall be made scoording to the fiscal regulations of the United States
- 10. The State Board of Land Commissioners shall use their regular employees, so far as their other duties permit, in systematically locating cultivated black currents and infected blister rust host plants and in scouting for white pine blister rust.
- 11. All official records of the work performed under this agreement shall be open to inspection by any or all parties to this agreement. All

findings of the blister rust made by any parties to this agreement shall be promptly reported to all other parties to this agreement. All specimens collected by any party to this agreement, which are suspected to be infected with blister rust shall be submitted to the Department of Plant Pathology, University of Idaho, which will in turn forward them to the U.S. Bureau of Plant Industry for final determination. The U.S. Bureau of Plant Industry shall give such technical information to the employees of the parties to this agreement as will enable them to recognize the several stages of this disease.

12. It is understood that the Bureau of Plant Industry, U. S. Department of Agriculture, shall be primarily responsible for scouting and locating the clister rust in Idaho and for furnishing technical information on its control, but that the Federal government has no authority to destroy private or state property and therefore that the Idaho State Department of Agriculture shall be wholly responsible for destroying such pines, current and gooseberry plants as may be found necessary in order to control the spread of this disease in Idaho, including plants shipped in violation of State and Federal blister rust quarantines and regulations.

13. This memorandum of understanding shall take effect
May 1, 1924, and continue in force until June 30, 1925, or until
previously terminated by mutual consent of the parties to this agreement.
This memorandum of understanding will supersede any other such memorandum
in existence between the agreeing parties.

			*A.),	Estimated value
	Da	te	Signatures	of Cooperative
May	1.	1924	M. A. Means	Work
			Commissioner, Idaho Department of Agricult	
			, , , , , , , , , , , , , , , , , , , ,	
May	1.	1924	M. L. Dean	\$4,200.00
			Director, Bureau of Plant Industry, Idaho	
			Department of Agriculture.	
			a to one	b
			I. H. Nash	
	•		State Land Commissioner	The Contract
		N	w G	- 0.
May	1.		F. G. Miller	
	,	*61	Dean, School of Forestry, University of	•
	1.	water of the	Idaho.	3.050.00
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May			E. J. Iddings	
			Director, Agricultural Experiment Station	n.
	44.		University of Idaho, and Director of	
			Extension	300.00
17.2	. Dayle		The state of the s	

Pathologist, Agricultural Experiment Station,

Chas. W. Hungerford

University of Idaho.

May 1, 1924

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15. This memorandum of understanding shall take effect May 1, 1924, and continue in force until June 50, 1925, or until previously terminated by mutual consent of the parties to this agreement. This memorandum of understanding will supersede any other such memorandum in existence between the agreeing parties.

Cocperative Constitue	wagea	<u>te</u> 1924		May
00.003.	M. L. Dean Director, Bureau of Plant Industry, Idaho Department of Agriculture.	1924	1,	Veli
	I. H. Nash State Land Commissioner	1924	. 1,	Teli
3,050,00	T. G. Miller Dean, School of Porestry, University of Idaho.	1924	1,	May
300.00	E. J. Iddings Director, Agricultural Experiment Station, University of Idaho, and Director of Extension.	1924	1,	vel.
4 uc	Chas. W. Hungerford Pathologist, Agricultural Experiment Static University of Idahc.	1924	1,	Kay

May 1, 1924	A. W. Laird	
May 1, 1724	President, North Idaho Forestry Association.	
May 1, 1924	-W. D. Humiston Secretary, Potlatch Timber Protective Association.	
May-1, 1924	T. J. Humbird President, Clearwater Timber Protective Association.	\$11,500.00
	B. H. Hornby President, Pend Oreille Timber Protective Association	
May 1, 1924	J. P. McGoldrick President, Coeur d'Alene Timber Protective Association.	
May 1, 1924	Ben. E. Bush President, Priest River Timber Protective Association.	
May 1, 1924	W. A. Taylor Chief, Bureau of Plant Industry, U. S. Department of Agriculture.	7,000.00
	Total	\$26,050.00

The work for the season outlined and approved by the Executive Committee for Idaho in consultation with the Western Office of White Pine Blister Rust Control included the scouting for the disease and the eradication of cultivated black current bushes in the following counties:

Adams Lemhi Clark idaho (northern portion Washington Gem Fremont covered in 1923)
Valley Boise Butte

In addition it was agreed that any time remaining after completing the work in the counties just listed be spent in a careful recheck of Boundary and Bonner Counties.

Since the work in the central Idaho counties required less time than anticipated, time was also available to check Lewis, Nezperce and the northern part of Idaho Counties.

The following tabulation gives the results of the cultivated black current eradication program in Idaho during the past season:

	A. W. Laird President, Korth Idaho Forestry Associ- ation.	1924	May 1,
	W. D. Humiston Secretary, Potlat dn Timber Protective Association.	1924	May 1,
%11,500.00	T. J. Hunbird President, Clearwater Timber Protective Association.	1924	Lay 1,
	B. H. Homby President, Pend Oreille Timber Protective Associations.	1924	er you
	J. P. McGoldrick Profident, Coeur d'Alene Timber Protective Association.	1924	el Veli
	Ben. M. Bush President, Friest River Timber Protective Association.	1924	May 1,
	V. A. Taylor	1924	May 1,
7,000.00	Chief, Sureau of Plant Industry, U. S. Department of Agriculture.		
00.050.08\$	Total		

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molinog medali	tasho (nort	Clark	Lemni	Adams
vered in 1925)	700	Fremont	Gem	Washington
		Butte	Boise	Valley

In addition it was agreed that any time remaining after completing the work in the counties just listed be spent in a careful recheck of Boundary and Bonner Counties.

Since the work in the central Idaho counties required less time than anticipated, time was also available to check Lewis, Wesperce and the northern part of Idaho Counties.

The rollowing tabulation gives the results of the cultivated black-current eradication program in Idaho during the past season:

TABLE III

Status of Cultivated Black Current Eradication Work in Idaho,
November 1. 1924.

	:	Erad:	ica	ted	:	Not Eradi	Eradicated		:	To	tal	
County	: I	lanting	s:	Plants	: I	lantings:	P 1 a	nts	:P	lant in	gs:P	lants
Adams	:	1	:	4	:	:			:	1	:	4
Boise	:	none	:	none	•				:	none	:	none
Butte	:	none	:	none	:	:			:	none	:	none
Clark	:	1	:	2	:	:			:	1	:	2
Custer	:	none	:	none	:	:			:	none	:	none
Fremont		245	: 7	2222	: -	1:	#	12	:	246	: 2	234
Gem	:	2	:	28	:	:			:	2	:	28
Idaho	:	21	:	75	:				•	21	:	75
Lemhi	:	14	:	68	*	:			*	14	:	68
Valley	:	2	:	2	:				:	2	:	2
Washington	*	5	:	20					:	5	:	20
Lewis	:	1	8	, 1	:				:	1	:	1
NezPerce	:	1	:	1	:	:	Ţ.		:	1	:	1
Bonner	:	22	:	56	:	•			:	22	:	56
Boundary	:	11	:	70	:	:			:	11		70
Total	:	326	: 2	2549	:	1 :		12	:	327	:2	561
#This paticular	n	anting	ic	Locati	he	practical	737	on	the	Wyomi:	no 7	ine.

#This paticular planting is located practically on the Wyoming line. The farm on which it exists is many miles from any tree. Mr. Wilson, the owner, is an intelligent progressive individual, but absolutely refuses to permit the destruction of his bushes until the black current law has been tested in an actual case.

It is interesting to note that a total of 34 plantings comprising 126 bushes were located in the recheck of Bonner and Boundary Counties. The black current eradication work was carried on more or less along the general plan formulated last winter. The plan referred to had to be modified somewhat to meet local conditions, but the underlying thought - thoroughness - was always adhered to. The fact that 34 plantings were found in Bonner and Boundary Counties indicates in my mind, two things, namely; (1) that we have at last developed a satisfactory method for scouting for black currents, and (2) that it will be necessary to check Latah, Benewah, Shoshone, Kootenai and Clearwater Counties.

Compensation for Destroyed Black Current Bushes.

The total amount paid by the State Department of Agriculture to reimburse owners of cultivated black currants approximates \$467.85, or an average of about 18 cents per bush.

I am thoroughly convinced that reimbursing the owner for his bushes is fundamentally sound business and that in the long run it will turn out to be a good investment.

Status of Jultiveted Black Gurrant Tradication Work in Idaho, Movember 1, 1924.

	Erad	eel	ed	: 1.0	MIN	scios	Det		toli	Let	
T:	lanting	1:27	lants	:Plan	ting	gs:Pl	entes	CL 3	lant in	rs:E	Lants
:	Ι	*	47	:		:		* *	1	•	1
:	none	;	none	3		:		3	none	:	non
:	ottott	:	none	:		3		7	ettott	:	none
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Componsation for Destroyed Black Currant Bushes.

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I am thoroughly convinced that reimbursing the owner for his bushes is fundamentally sound business and that in the long run it will turn out to be a good investment.

School Campaign

During the early spring a school campaign was carried on in the public schools of all the counties of central Idaho. The following tabulation gives the results of this campaign:

TABLE IV

	- 7	Turnella and and	7.		7	Tumbon Donomt
County	:1	Tumber of leachers Sent Laterial		Number of Replies		Number Report- ing Currants
Butte	:	30	:	3	:	0
Lemhi	:	48	:	9	:	1
Boise		23		6	:	0
Idaho	:	127	:	27	:	3
Washington	:	95		11	:	3
Payette	:	67	:	6	:	2
Valley	:	40	:	9	:	
Adams	:	42		4	:	1
Gem	:	72		14	:	• 4
Fremont	:	98	:	8	:	2
Custer	:	38	:	11	:	2
Clark	:	22	2	4	:	0,
Total	:	702	:	112	:	18

Replies - Location Unknown - 6

The number of replies received is a little discouraging but can probably be accounted for by the fact that the currants were not yet in leaf at the time the program was carried on. In every case where leaves were sent in with the report of "black currants found", the leaves proved to be R. aureum.

In my opinion, school campaigns as a means of locating cultivated black currants in Idaho, are a failure, primarily on account of the fact that in many parts of the state the schools close before the vegetation leafs out in the spring.

As a means of publicity, school campaigns of some sort are of inestimable value and many personal experiences during the past year substantiated this belief.

1.13 Cultivated Black Current Eradication in Washington.

Cultivated black current eradication was conducted in Washington under the direct supervision of the Spokane office. No cooperative agreement was drawn up between the Bureau of Plant Industry and the Washington

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	: Number of	:- '		mull:	er Report-
County	:Teachers	J. 1:	to reduc	; in	Currents
	: Sent		Reglies	:	
	imaterial:	:			
Butte	: 50	:	2	:	0
Lenioi.	: 48	*	6	:	S.
Soise	: 23	:	ð	:	О
Idaho	: 127	*	27	:	3
Washington	: 95	7	1.1	:	5
Payette	70 :	:	6	:	S
Valley	: 40	:	6	:	0
Adams	S.A :	- :	4	:	1
men)	27	:	75	7	.A.
Fremont	88 :	3	8	:	S
Custer	: 58	:	II	:	S
Olark	SS :	3	A	3	0
LetoT	: 702		112		18

Replies - Location Unknown - 6

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As a means of publicity, school campaigns of some sort are of inestimable value and many personal experiences during the past year substantiated this belief.

1.15 Caltivated Black Current Bradication in Vashington.

Gultivated black current eradication was conducted in Washington under the direct supervision of the Spokane office. No cooperative agreement was drawn up between the Bureau of Plant Industry and the Washington

State Department of Agriculture, to cover this work. The Field Assistants employed by this Office worked independently of any state agency, securing the eradication of cultivated black currants by direct contact and cooperation with the owners of the bushes. When the consent of an owner was obtained to have his bushes removed, his signature was secured to a release slip, the form of which is as follows:

I hereby give to the United States Department of Agriculture, through its authorized agents, cultivated black currant bushes, in order that they may be destroyed. The gift of these plants is made willingly in the interests of public welfare in order that the western white pine forests may be protected.

Date '	ъ.		Par
		185 SM 1	, NE PER THE
		A4	Signed
<u> </u>	- **	w. ,	Higher v P. File
And the second of the second o	*****		Address

Prior to the 1924 field season, cultivated black current eradication had been conducted in Washington in the following areas;

Western Washington - counties west of the summit of the Cascades.

Eastern Washington - Ferry, Stevens, Pend Oreille and Spokane Counties.

The work during the 1924 season was planned to extend the area free of cultivated black currants along the Canadian border, and also along the Washington Idaho state line, in order to delay the spread of the rust into this country from British Columbia, and to further protect the large areas of commercial and young white pine in northern Idaho.

During the field season, 6 men with 3 autos were in the field. The work was started in the extreme southeastern corner of Washington, and progressed in a north and northwest direction. Columbia, Carfield and Asotin Counties were entirely completed, on an intensive basis which should preclude the necessity of further work there. Whitmen County was about half done, it being left incomplete in order to have the men working in Okanogan County at the season most favorable to finding the rust if present. This latter county was also about half completed.

The more intensive working method, as boutlined on page ____, was thoroughly put into effect in eastern Washington during the past summer. The general effect of such a method may be stated as assuring accuracy and and thoroughness, but at the expense of speed. It is considered, however, as being superior to the older, more extensive methods, in that the ground which is once covered will not need to be reworked. In other words, its value will be more apparent the second and third year than the first.

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		uuspinaaluus da maanna maanna maanna kaapuunguu sanuuskoo duunikmuskin ka maakunnikma da 2000. T	Date
	Signed		
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Western Washington - counties west of the summit of the Cascades. Eastern Washington - Ferry, Stevens, Pend Oreille and Spokune Counties.

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Table V, given below, shows the number of cultivated black currant plants and plantings eradicated in eastern Washington during the past summer, including some clean-up in the northeastern counties:

TABLE V

Results of Cultivated Black Current Eradication,
Washington.

	:	Plantings	:	Plants
County	:	Eradicated	:	Eradicated
Stevens	:	6	:	29
Ferry	:	3	:	34
Pend Oreille	:	8	:	31
Spokane	:	20	:	107
Okanogan	:	24	:	258
Whitman	:	46	:	485
Columbia	:	4	2	8
Garfield	:	2	:	3
Asotin	:	15	:	71
Total	:	128	:	1026
	-		-	

1.14 Cultivated Black Currant Eradication in Oregon

Cultivated black currant eradication in Oregon was conducted under the terms of the following cooperative Agreement between the Oregon State Board of Horticultura, the Oregon State Board of Forestry, the Oregon Agricultural College, and the Bureau of Plant Industry:

MEMORANDUM OF UNDERSTANDING BETWEEN THE OREGON STATE BOARD OF HORTICULTURE, THE OREGON STATE BOARD OF FORESTRY, THE OREGON AGRICULTURAL COLLEGE AND THE BUREAU OF PLANT INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE RELATIVE TO COOPERATIVE WORK ON THE CONTROL OF WHITE PINE BLISTER RUST IN OREGON.

EFFECTIVE JULY 1, 1924 to JUNE 30, 1925.

The object of this memorandum of understanding shall be to facilitate the prompt location and eradication or effective control of white pine blister rust in Oregon in view of the threatened destruction of private, state, and nationally owned timber throughout the West as a result of the presence of this disease in British Columbia and Washington, and the danger of its further spread by natural dissemination or quarantine violations.

Pable V, given below, shows the number of cultivated black current plants and plantings eradicated in eastern Washington during the past summer, including some clean-up in the northeastern counties:

V EJEAT

Results of Cultivated Black Current Tradication, Vashington.

Plants Tradicated	:	Plantings Eradicated	:	County
03	:	6	3	Stevens
74	;	3	:	Ferry
31	;	3	:	Pend Creille
107	8	20	2	Spokane
258	:	24	:	Okanogan
485	:	46	:	Whitman
8	;	4		Columbia
3	:	S	:	Garfield
TA.	:	15	*	Asotin
1026	-	128	1	Total

1.14 Cultivated Black Currant Bradication in Orogon

Gultivated black current eradication in Oregon was conducted under the terms of the following cooperative Agreement between the Oregon State Board of Horticultura, the Oregon Agricultural Gollege, and the Eureau of Plant Industry:

MEMORATUM OF UTUTRISTANDING BIT THE LIT ORIGIN STAIN JOANS OF HOLLICULARIES, THE ORBINO STAIN DOARD OF PORTURES, THE ORBINO AND THE BURIEU OF FLAVE HIDUREY, UNLITED STATES DEPARTMENT OF AGRICULTURE HELASIVE TO COOPERATIVE HORK ON THE COURSE, WHIST FIRE BLISTER RUST IN ORIGINA.

THEECHIVE JULY 1, 1924 to JUNE 50, 1925.

The object of this memorandum of understanding shall be to facilitate the prompt location and eradication or effective control of white pine blister rust in Oregon in view of the threatened destruction of private, state, and nationally owned timber throughout the Vest as a result of the presence of this disease in British Columbia and Jashington, and the Aunger of its further spread by natural dissemination or quarantine violations.

It is agreed that the Oregon State Board of Horticulture, the Oregon State Board of Forestry, the Oregon Agricultural College, and the Bureau of Plant Industry shall cooperate to the above ends in accordance with the following plan:

- l. The Bureau of Plant Industry shall pay the salaries and expenses of one or more men who shall perform necessary scouting for the disease in Oregon. The Oregon State Board of Horticulture shall deputize these scouts to enable them to enter and inspect any property.
- 2. In view of the fact that the Oregon State Board of Horticulture has no special appropriation for blister rust control, the Bureau of Plant Industry shall pay the salaries and expenses (in accordance with the fiscal regulations of the United States Department of Agriculture) of one or more men who shall be deputized by and work under the authority and direction of the Oregon State Board of Horticulture to locate and secure the general destruction of cultivated black currant plants in Oregon. These men shall also destroy host plants diseased with or exposed to infection from white pine blister rust, as directed by the Oregon State Board of Horticulture.
- of Plant Industry shall cooperate in inspection for the purpose of aiding in the enforcement of State and Federal blister rust quarantines now in effect or which may be promulgated. The Bureau of Plant Industry shall pay the salaries and expenses and direct the work of one or more men who shall during the proper season inspect for violations of the Federal blister rust quarantines in the State of Oregon. These men shall also cooperate with the Oregon State Board of Horticulture in enforcing State quarantines. For this purpose they shall receive instructions in methods of procedure from the Oregon State Board of Horticulture and shall be deputized to destroy plants shipped in violation of State quarantines.
- 4. The Oregon State Board of Horticulture and its cooperators shall use their regular employees, so far as their other duties permit, in systematically locating and destroying cultivated black currants and infected or potentially infected blister rust host plants; in inspecting nurseries for this disease and in enforcing State and Federal blister rust quarantines. Such work will aggregate approximately 2,650 man days, representing a total expenditure on the part of the Oregon State Board of Horticulture and its cooperators of about \$9,275.00 for the control of this disease. The expenditures of the Bureau of Plant Industry indicated in previous paragraphs will aggregate approximately \$6,000.00 but none of the Federal funds shall be spent in compensation for plants destroyed in control work.
 - 5. The Oregon State Board of Forestry shall use its regular employees, so far as their other duties permit, in systematically locating cultivated black currants and in scouting for the

- It is agreed that the Oregon State card of Forticulture, the Cregon state Board of Forestry, the Oregon Agricultural College, and the Dureau of Plant Industry shall cooperate to the above ends in accordance with the following plan:
- 1. The Eurosa of Plant industry shall pay the saleries and expenses of one or more men who shall perform necessary scouting for the disease in Oregon. The Cregon State Doard of Morticulture shall deputize these scouts to entble them to enter and inspect any property.
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 - 5. The Oregon State Deard of Forestry shall use its regalar employees, so far as their other duties permit, in systematically locating rollivated black currants and in scouting for the

blister rust on its wild and cultivated host plants. Such work will aggregate a total expenditure by the Oregon State Board of Forestry of approximately \$5,000.00 for the control of this disease during the period covered by this agreement.

- 6. The Oregon Agricultural College agrees to examine all specimens suspected of being infected with white pine blister rust when sent in by the field scouts and others, and to keep the necessary records of such collections. It is also agreed that all specimens which are suspected of being infected with the blister rust shall be submitted to the Bureau of Plant Industry for final determination. It is further agreed that the Oregon Agricultural College shall furnish Mr. L. M. Goodding, the representative of the Bureau of Plant Industry engaged in blister rust control work in Oregon such office space as is necessary for properly conducting his work. Such work will aggregate an expenditure on the part of the Oregon Agricultural College of approximately \$1,000.00 for the control of this disease, during the period covered by this agreement.
- 7. All official records showing work performed under this agreement shall be open to inspection of the Oregon State Board of Horticulture, the Oregon State Board of Forestry, the Oregon Agricultural College or the Bureau of Plant Industry on request. All findings of the blister rust made by either the Oregon State Board of Horticulture, the Oregon State Board of Forestry, the Oregon Agricultural College or the Bureau of Plant Industry shall be promptly reported to the other parties. All specimens collected or received by the Oregon State Board of Horticulture, the Oregon State Board of Forestry and their cooperators which are suspected to be infected with blister rust shall be submitted to the Oregon Agricultural College for critical determination. The Bureau of Plant Industry shall give such technical information to the employees of the Oregon State Board of Horticulture or the Oregon State Board of Forestry and their cooperators as will enable them to recognize the several stages of the disease.
- 8. It is understood that the Bureau of Plant Industry shall be primarily responsible for scouting and location of the blister rust in Oregon and for technical information on its control, but that the Federal Government has no authority to destroy private or state property and therefore the Oregon State Board of Horticulture shall be wholly responsible for the destruction of such pine, currant and gooseberry plants as may be found necessary in order to control the spread of this disease in Oregon, including plants shipped in violation of State and Federal blister rust quarantine regulations.
- 9. This memorandum of understanding shall take effect July 1, 1924 and continue in force until June 30, 1925, or until previously terminated by mutual consent of the parties concerned.

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SIGNATURES:

Date

August 7, 1924	(Sg.) Chas. A. Park Oregon State Board of Horticulture Pres.
August 7, 1924	(Sg.) T. A. Elliott, State Forester Oregon State Board of Forestry.
August 8, 1924	(Sg.) H. P. Barss, Plant Pathologist O.A.C. Oregon Agricultural College.
August 27, 1924	(Sg.) K. F. Kellerman Acting, Chief Bureau of Plant Industry U. S. Department of Agriculture.

To directly supervise blister rust work in Oregon, Mr. L. N. Goodding, of this Office is stationed at Corvallis. The following report by Mr. Goodding covers his work during the past year.

The work of 1923 was of such a nature that it shaped a program for 1924. Many of the blank forms used in 1923 proved practicable for 1924 as well. There was a decided abatement of the work in the schools as it was found that the continuous circularizing of the teachers failed to bring the desired results. Only one letter was sent out during the year. This was in the nature of a follow-up of the fall campaign and was intended for use as a poster on bulletin boards. Nothing more should be done until the Office is prepared to cooperate with the State Superintendent to put something of a permanent nature into the Schools.

The principal work done was black currant eradication. A crew of five men was placed in the field June 15 to locate and eradicate black currants. Two Fords and three bicycles constituted the chief means of travel. Two additional men were sent from the Spokane office in August and another Ford was brought into service. These last two men remained in the Oregon work about a month. The territory covered was mostly west of the Cascades and south of the northwest counties which had been worked the previous season. The accompanying table shows the status of this work.

The eradication work was supplemented by that of the State
Horticultural Board. All of the federal men were deputized by the
State Board, and county fruit inspectors cooperated with them in location
and eradication work. Mr. Dow, the county fruit inspector in Clatsop
County secured the eradication of Mr. Bates' bushes, an excellent piece
of work, as this case threatened to involve the state in a court procedure.

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Mr. Stansbery, the State Inspector, accompanied Mr. Goodding to Clackamas County and interviewed Mr. McAuley, who finally consented to have his bushes destroyed. Mr. Walker of Multnomah County on numerous occasions used his Ford in taking Mr. Goodding to different points in and about Portland to secure black currant eradication. Mr. Van Trump of Marion County and Mr. Carpenter of Douglas County each rendered valuable service in cooperation with the blister rust forces. There are others who assisted in a lesser degree.

Correspondence was carried on with individual fruit inspectors and each was supplied with blister rust literature.

A copy of the form of deputation supplied the blister rust scouts accompanies this report. As there are five commissioners in Oregon, it was necessary to have these deputations signed by the commissioners in charge of the districts in which eradication work was done.

In cooperation with the State Forestry Department letters were sent to about 400 fire wardens and other officials. No report of Ribes and pine distribution was made, as this work had been done during 1923. At the meeting of the state fire wardens in July, blister rust was discussed for perhaps 40 minutes. An excellent spirit of interest and cooperation prevailed.

Owing to the extremely dangerous fire season, the blister rust work of the U. S. Forest Service was suspended. Reports of Ribes and pine distribution for most of the Forests had been received, however, through Dr. Boyce's office. While the information given was in some cases excellent, all showed the densest ignorance of blister rust. This is the fault of the blister rust office. The Blister Rust News Letter and other types of special blister rust literature should reach the federal forest service men frequently.

After Mr. Goodding had conferred with Professor Maris, Director of the Extension Service, O. A. C., and with Professor Johnson of the same department, letters were written to all of the county agents notifying them of the date when blister rust scouts would be likely to reach their territory and requesting them to assist the scouts in publicity work and in whatever ways seemed best. The county agents were especially helpful in getting exhibits placed at county fairs.

Exhibits were put up at county fairs in Ling, Lane, Coos, Josephine, and Deschutes Counties and at the State Fair at Salem. It was impossible to get material together to put exhibits at other county fairs, one great trouble being that many of the fairs occurred on approximately the same dates. At each of the county fairs where exhibits

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were placed, literature was distributed. Mr. Wyckoff's summary reached Corvallis too late for use in connection with these exhibits except those at the State Fair and the Deschutes County fair. Sets of questions and answers on blister rust were used in the other cases. The exhibit at Salem attracted much attention. The exhibits in Lane and Coos Counties were poorly placed and did little good. Like much educational work, the value of exhibits must be estimated by eyes of faith, as tangible results are seldom forthcoming.

Newspaper work consisted largely in write-ups in the different counties in which black current eradication took place. In every case the newspaper men were given interviews and in most cases excellent and effective write-ups were made. The value of the local news sheet as an educational medium is very great. It seems to be more generally read by the country folk than the large dailies. The way for the scout is prepared by the write-up in the local paper and this is a distinct advantage.

The blister rust filmw was first run at the Flower show at the College in Corvallis. It was run at least 12 times a day for three days. Literature was distributed at the same time. The film was also run at Salem, Eugene, Albany, Silverton, and Grants Pass. In each town the film was shown at the regular motion picture houses for matinee and evening performances, two days at Salem and three at the other points. No literature could be distributed in these places.

The Botany Department at 0. A. C. is giving a prominent place in its courses to blister rust study. Three things seem to stimulate this. First, the Office having a man permanently stationed at the College; second, Professor Barss being a member of the executive blister rust board; third, the fact that many 0. A. C. students are used in blister rust work during the summer.

The Forestry Department at U. A. C. and the Botany Department of the State University have made repeated requests for blister rust exhibits. To date, nothing has been provided.

No special nursery inspection work was done except at the Oregon Nursery at Orenco. All nurseries in the region where black currants were eradicated were thoroughly inspected, however, at the time such localities were reached by the scouts. These inspections revealed in some cases a few black currants which had sprouted from crowns left in the ground when the nurseries had destroyed the bushes. In every case, however, such sprouting was slight. The eradication force did scouting for blister rust along the columbia below Portland and in western Washington during October, but this is reported elsewhere.

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WHITE PINE BLISTER RUST

by

Leslie N. Goodding, Assistant Pathologist,
Office Blister Rust Control,
U.S. Department of Agriculture.

In the consideration of this subject reference should be made to the last beinnial report pp. 220-226 which discusses in detail the nature of the disease together with facts regarding its distribution and means taken at that time to control it.

For those who may not have access to the last biennial report the following brief summary of the nature and life history of the disease may be helpful. It is caused by a fungus destructive to white pines of all ages. It also causes disease on currents and gooseberries. The latter plants are necessary to the spread of the rust to the pines as it never passes from pine to pine. Among the currents and gosseberries the most susceptible are the cultivated black currents, a variety introduced from murope. The disease is perennial on the pines. requiring two years or more from date of infection before it becomes evident and spores begin to shoot and from few to many years thereafter for the tree to die. During this time it is annually producing spores. On the currants and gooseberries the disease disappears in the late autumn or winter with the fall of leaves and reappears about two weeks after the first spores from diseased pines have germinated on the leaves in the spring. The first phase of the rust occurring on the currents and gooseberries produces spores which carry the disease to other currants and gooseberries. These cond phase produces spores which ultimately cause the disease to go to the pines.

The rust is not a native to this country. It was introduced from Germany into the eastern united States about 1900 and from France into the Northwest about 1910. Since its discovery in the East in 1906 its extreme seriousness has been learned and methods of control developed. It was not discovered in the Northwest until 1921 and since that time the west, learning a lesson from the very expensive experience of the East, has been active in inaugurating control methods.

Since the last biennial report went to press much has been learned of the distribution of the disease in the northwest. The scouting in British columbia in 1923 revealed the disease in an almost continuous belt from the vancouver region to nevelstone and seaton. The arid valleys between the mountain ranges showed the disease to be widely distributed on cultivated black currants. The infection was even found extending into the okanogan region in eastern washington and to a point within 35 miles of the idaho line in British Columbia

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Stocen Indianolf as if a data madeous symmeth and part of oscars you of the respective feeth of the new party and the recurrence of the otid. of swiderites argument to be about the about of expression gions of all wes. It also couser disease on currents of gooseberries. The latter lants are researched to in a control of the print to the pines Ls it never junes include to pine. That the community was gooseborning the Lord nurger times are the cultiveter blact current. v rick invectored from maroge. The discuse is percential on the pines, remaining of the area of a state of the color of the color of the color evident and sport thet. to alcot and from for to wall curt thursefft : for the tree to de. Array this time it is contain producing sporas (n the communication costbornies the disease disagneers in the late antrom or winter title file of letves and reappears about two their affile the filth plores from classed and have ger insted on the leaves in the rings the first passe of the rust occurring or the currents and good bearies produces a cres which carry the disease to other arrants and pros service. Thesecond that a product a porce which ultimately cause the lieeuse to go to the pines.

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continued that is to improve that to press and is not seem learned of the continued in the continued in the continued in the continued in the continued of the continued in the incomplete of the continued of the

The area of infection about Beaton and Revelstoke proved to be very extensive. When it is recalled that Beaton and Revelstoke are in the belt of western white pine extending south into Idaho and Montana the seriousness of the situation can be comprehended. Up to the close of the scouting season of 1923 only three disceased pines had been found in the State of Washington, the very wide distribution being on cultivated and native black currants. Two of the lacations on pines were found in Mt. Vernon and one in Blaine, neither of which are far from the Canadian boundary. In the spring of 1924, however, disceased pines were found on both sides of the Olympic peninsula at points much farther south than Mt. Vernon. Ilwaco remains the furthest point south for infected currants, there being no report of the disease up to this time in Oregon.

Investigations in British Columbia since the discovery of the disease in 1921 have revealed that spores from diseased pines may be viable and may produce the disease after being carried by the wind at least 100 to 150 miles. This results in the rapid spread to currants and gooseberriesduring seasons favorable to the development of rusts. Such seasons are those having high humidity. Heavy deems are apparently as good as rains. The summer of 1922 and 1923 were favorable for the spread of the rust whereas 1924 was very unfavorable. During the last season it was not found at many of the points distant from centers of pine infection where it was found the two preceding seasons. This must not, however, be taken to mean that the disease is receding. Infected pines constitute the real outposts of the disease. The diseased pines on the Olympic Peninsula may be expected to spread the rust far bejond its present known range when a favorable rust year occurs.

Since the rust was found in the Okanogan region in eastern washington all thought that natural barriers to the disease may exist has been abandonded. The existance of the rust in the heart of the dry belt and east of the Coast Range serves to convince the most optimistec that the disease is not stopped by anything short of an ocean.

As stated in the last biennial report western white pine is very susceptible to the disease, in fact, it seems to be the most susceptible species known. As the rust has never reached the sugar pine areas its action on the species might be questioned if Europe had not supplied us with all the evidence needed. Sugar pine is one of the white pines introduced into Europe from America and like the others it has fallen a victim to Blister Rust.

Convincing evidence continues to pour in against the cultivated European Black Current (R. nigrum). Owing to its extreme susceptibility and the open locations in which it is grown subjecting

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s stable to the distribution of sease, in Rect, it seems to be the most very susceptible to the disease, in Rect, it seems to be the most susceptible species amount. In the rust has never resolued the sugar pine areas its action on the species might be questioned if Turope Lad not supplied as with all the evidence needed. Sugar pine is one of the white wine introduced into larope from I wick and like the others it has fallen a victim to Blister must.

Journal of the continues to your in against the californial European Blact Turnent (A. nigran). (Nang to its extrance stace, till it is grown cubjecting

it to influence of the winds other currents or the gooseberries are not to be compared with it as a menace to the growing of white pines. In Farmers' Bulletin #1398 the U.S. Department of Agriculture goes on record in favor of discontinuing the growing of these currents thourophout the entire United States.

Two additional seasons of scouting have shown that the native black current (Ribes bracteosum) growing west of the Cascades is a serious host of the rust, in fact, second only to the cultivated European black current. It, however, is confined to stream banks and marshy places, often in dense shade, and is never exposed to the winds as the European black current. For this reason it cannot become so serious a menace in the spread of spores. It will be well to watch this native black current. In case o the disease is discovered within the state any of these bushes near cultivated white pines should be removed at once. This is equally imperative in native white pine stands but the magnitude of the undertaking would demand special consideration.

The control measures remain essentially the same as those enumerated in the last report. Since that time, however, Oregon, Idaho, and Montana have made special provision to eradicate the cultivated black currants and active steps have been taken to that end. Oregon has destroyed about 33,000 bushes. Most of the counties west of the Cascades where the growing of these plants was common have been covered by eradication crews.

Thorough scouting has been done each season not only in Oregon but throughout the northwest to determine the boundaries of the disease. In Oregon state and county inspectors, Fire Wardens of the State Department of Forestry, school teachers, pupils and many others have cooperated in scouting for the disease.

The Federal government in cooperation with the state of Oregon has maintained a rigid quarantine against the introduction of currants, gooseberries or white pines from the state of Washington or from east of the west line of Minnesota, Iowa, Missouri, Arkansas, and Louisiana. Federal inspectors have been maintained at Portland and Pendleton and state and county inspectors at many points throughout the state. In the absence of a federal inspector at Portland during the fall of 1923 the work was done by special provision of the State Board of Horticulture.

Mursery inspection has been faithfully done each season by federal scouts in connection with the general scouting for the disease. This work has been augmented by the state and county inspectors.

The Federal Blister Rust office in cooperation with timber men, state and federal forestry organizations and the different state departments of agriculture and horticulture in the Horthwest has inaugurated a ten-year Blister Rust program designed to control the

it to ifficence of the winds other currents or the possible and are not to be compared with it as a cance to the profing of the pines. In remover Bulletin 1898 the W.S. Repartient of the goes on record in lawor of discontinuing the graving of them currents thouroghout the entire United theces.

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The rederal leister hast office in cooperation with timber men, state and federal forestry organizations and the different recte depart ents of agriculture and horticulture in the Horthwort has inaugurated a tengen lister has program designed to central the

disease in white pine areas. This program provides for extensive local control work, black current eradication, quarantine enforcement, general scouting for the disease and experimental work. Provision is made in this program for continuing black current eradication in Oregon, for quarantine inspection at Portland and Pendleton, for general scouting for the disease, and for experimental local control work in a sugar pine region. Since the disease is not in Oregon at present the local control work will consist in the experimental eradication of currents and gooseberries in a designated area of dugar pines as a means of learning best methods and costs.

School children were enlisted in the campaign to locate cultivated black currents though they were also asked to send specimens they thought were diseased to the Agricultural College. This work proved to be most satisfactory in disseminating knowledge about Blister Rust. Many black current locations also were obtained in this way. The State Forestry organization, the Extension Service of the Oregon Agricultural College, the State Horticultural organization, the Department of Industrial Journalism of the Oregon Agricultural College and the newspapers of the state assisted in the general educational work. Some of the most enthusiastic workers have been former black current owners.

The Western Office of Blister Rust Control has been transferred from Seattle to 618 Realty Building, Spokane, Washington. Mr. S. N. Wyckoff has charge of the western work. An office for Oregon is also maintained in connection with the Botany Department of the Oregon Agricultural College. It is unnecessary for those wishing information about Blister Rust to write to the Spokane office as the office in the college is in a position to supply lituerature and answer your questions about Blister Rust. Address your inquiry either to Mr. Leslie N. Goodding or to Professor E. P. Barss, Botany Department, Oregon Agricultural College, Corvallis, Oregon.

Self And America

disease in this pine areas. This progress provides for extensive local control work, black current eradication, quartaline enforcement, general scouting for the disease and experimental work. Provision is made in this program for continuing black currant eradication in Oregon, for quartantine inspection at fortland and fendleton, for general scouting for the disease, and for experimental local control work in a sugar pine region. Jince the disease is not in Oregon at present the local centrol work will consist in the experimental eradication of currents and geoscopyries in a desirate are of sugar pines as a means of learning best methods and costs.

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Leslie . doodding or to Professor ... Larss, Jotan Separt of t.

Oregon State Board of Forestry, Oregon Agricultural College, and The Bureau of Plant Industry, U. S. Department of Agriculture.

> Botany Department, O. A. C., Corvallis, Oregon, June 1, 1924.

Dear Sir:

Blister Rust Again. Last season we failed to find it in Oregon but this should not make us less vigilant this season for the disease is advancing and we may expect it to creep in at any time.

The Blister Rust Office is putting a crew of men into the field again this summer. These men will locate and eradicate all the cultivated black currents possible, and inspect pines, currents and gooseberries for Blister Rust.

To make their work most successful these men need the cooperation of every possible agency that can be enlisted in their support within the state. By virtue of their duties and the localities in which they work the fire wardens can render valuable assistance.

The suggestions contained in this letter meet with the approval of Mr. Elliott, the State Forester.

Judging the fire fighters by past performances we are relying on you as one of them to cooperate with us:

lst. By keeping a keen lookout for Plister Rust on both five-needled pines and the currants and gooseberries.

2nd. By reporting at once to the Blister Rust Office at the Agricultural College at Corvallis any case you suspect of being Blister Rust.

3rd. By reporting plantings of cultivated black currents.

4th. By assisting the Elister Rust Scouts when they reach your locality in every way your duties will permit, 5th. By spreading reliable information about Blister Rust.

Under separate cover I am sending you literature on the

Thanking you for your cooperation, I am

Yours very truly,
Leslie N. Goodding
Junior Pathologist.

LNG/K

subject.

the second of th

Thirty-second Legislative Assembly--Regular Session.

HOUSE BILL NO. 263.

Introduced by MR. CRAMER (by request) and read first time January 29, 1923.

A BILL

For an act to declare the cultivated black currant (ribes nigrum) and the common barberry (berberis vulgaris) and its varietées a public nuisance and providing for their eradication.

Be It Enacted by the People of the State of Oregon:

Section 1. The cultivated black currant (ribes nigrum), a most dangerous host plant of the white pine blister rust disease (cronartium ribicola) which disease seriously attacks the fiveneedle pines including western white pines and sugar pines native to Oregon, and the common barberry (berberis vulgaris) and its varieties, a dangerous host plant of the black stem rust of wheat and other cultivated grains and grasses (puccinia graminis) are by reason of their menace to valuable products of the soil in Oregon hereby declared to be a public nuisance, and the several commissioners of the state board of horticulture, the state inspector, or the county inspectors are hereby invested with the power to abate the nuisance in a summary manner.

Section 2. It shall be unlawful for any company, corporation, society, association, partnership or any individual or combination of individuals in the State of Oregon to grow, propagate or distribute cultivated black currants (ribes nigrum) or common barberries (berberis vulgaris) or varieties of the same.

Section 3. Any company, corporation, society, association, partnership or any individual or combination of individuals violating the provisions of this act shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not more than one hundred dollars (\$100).

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HOUSE BLE NO. 25U.

Introduced by IR. (By request) and first time time. James years, 1985.

Julio A

For an act to declars the emitive teasures current (ribes in man) and the common barberry (berberis valuaris) and its varieties a public massance and providing for the le explication.

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of the state board of horticulture, the state house to about the
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COOPERATIVE BLISTER RUST CONTROL

Superintendent of Public Instruction, Oregon Agricultural College, Bureau of Plant Industry, U.S. Department of Agriculture.

OREGON'S FORFSTS: "A GOOSE WITH A GOLDEN EGG."

The total value of Oregon's agricultural crops, including fruit, in 1922 was \$75,000,000.

The value of the lumber cut in Oregon in the same period was \$100,000,000.

43,000 persons were employed directly in the lumber industry. Lumbering provided 65% of the industrial payroll of the state.

Then the chief crop of Oregon is not wheat, hay, apples or prunes but lumber and --

The prosperity of our state depends upon the protection and perpetuation of all and every integral part of our forests.

White and Sugar pines form about two percent of our entire forests, and from the standpoint of quality yield the most valuable lumber. As these stand in the forest, untouched by axe or saw, they are worth \$27,000,000.

If White Pine Blister Rust is introduced and not controlled it will destroy our White and Sugar pine forests.

CULTIVATED BLACK CURRANTS are the chief agents in contracting, harboring and spreading this disease. They should be destroyed. The law of the state demands their destruction.

Fave your pupils located all the CULTIVATED BLACK CURPANTS in your district?

If you surmise that some bushes have been overlooked will you have the children renew their search this spring?

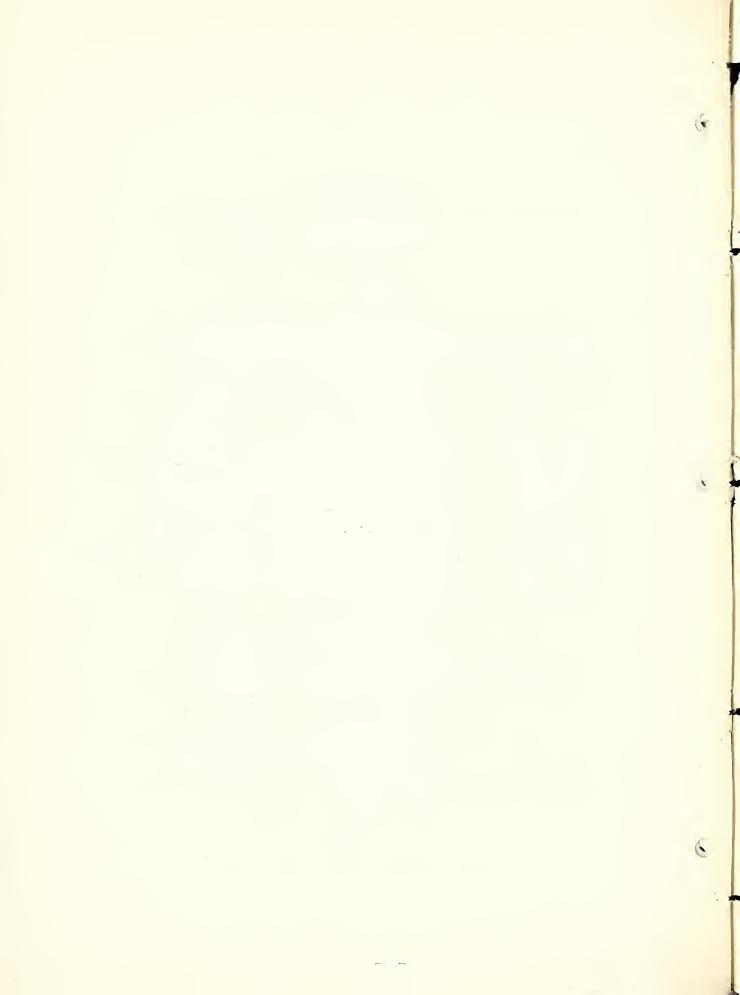
The literature sent you last fall will tell you all about this disease.

Yours for the preservation of Oregon's White and Sugar pines.

F. P. Barss. Collaborator.

FOTE: Please post this where it will be read by your teachers.

Agricultural College, Corvallis, Oregon, April 15, 1924.



Careful record should be entered on these sheets from the field notes at the close of each day.

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QUESTIONS AND ANSWERS CONCERNING THE DISEASE

WHITE PINE BLISTER RUST

- 1. Q. What is white pine blister rust?
 - A. It is a plant parasite which attacks white pines and currents and gooseberries and is very destructive to white pines. It is very similar in nature to grain rust which attacks the barberry as well as the grain.
- 2. Q. How can we recognize it?
 - A. A rust is so called because it resembles rust as that on iron. The stage first appearing on the current or gooseberry leaves strikingly resembles small spots of rust on the under surface of the leaves. A later stage has the appearance of short hairs. It is always well to send leaves you think are diseased to the Botany Department, Oregon Agricultural College, Corvallis, Oregon. It is in a position to give you definite information. On white pines the rust makes its appearance as swellings on branches or the main stem or bole. These swellings crack open and orange colored spore bodies protrude. These are not only visible; they are conspicuous. From these spore bodies millions of spores are released which infect currents and gooseberries.
- 3. Q. Does this disease attack other plants?
 - A. It attacks only the pines, currents and gorseberries,
- 4. Q. Does it do much damage?
 - A. It kills white pines of all ages and its presence in a region makes it impossible to grow these trees.
- 5. Q. Can it be controlled?
 - A. It can. It is only necessary to destroy all currents and goose-berries in regions where we wish to grow white pines. The disease never passes from pine to pine. It passes from pines to currents and gooseberries, from currents and gooseberries to other currents and gooseberries and finally from currents and gooseberries back to the pines.
- 6. Q. Has the disease been found in Orezon?
 - A. It had not been found up to June 1, 1924, but it will not be surprising if someone finds it this season.
- 7. Q. Is it doing any damage except in the Northwest?
 - A. It has already done great damage in the New England States and is costing thousands of dollars annually for local control there and in Wisconsin and Minnesota. The disease in Europe has made the commercial growing of white pine impossible.

- 8. Q. Where did the disease come from?
 - A. It was introduced into eastern United States from Europe some time before 1906 on nursery stock. The disease was introduced into British Columbia direct from Europe some years later.
- 9. Q. In what ways can I assist in controlling this disease?
 - A. a. Send specimens you suspect of being diseased to the Blister Rust Office, Botany Department, Oregon Agricultural College, Corvallis, Oregon.
 - b. Report to the same office information about any cultivated black current plantings remaining in the State.
 - c. Be careful not to order plants in violation of the state or federal quarantines.
 - d. Spread information to your neighbors about the disease.

QUESTIONS AND ANSWERS ABOUT THE CULTIVATED BLACK CURPANT

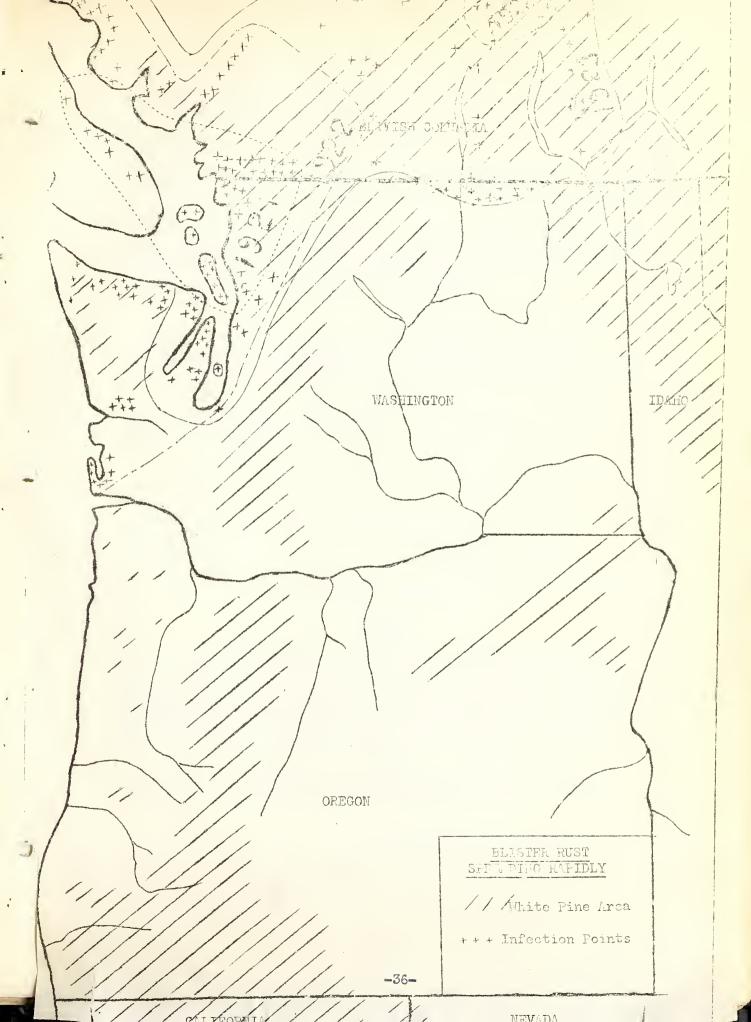
AND ITS RELATION TO WHITE PINE BLISTER RUST

- 1. Q. Why is the state eradicating the cultivated black current and not all currents and gooseberries?
 - A. Elister rust spores coming from great distances will produce the disease on cultivated black currents when other currents and goose-berries fail to take it. Again it produces spores in vast abundance and spreads the disease to both pines and currents or gooseberries much greater distances than any other currents or gooseberries. Cultivated black currents are of little value to the state while white pines are of vast importance.
- 2. Q. Is there any law compelling owners of cultivated black currents to destroy them?
 - A. The last legislature passed a law forbidding the growing or sale of cultivated black currents.
- 3. Q. Are there many black currents in the state?
 - A. We believe most of them have been destroyed. About 30,000 were removed during 1923.
- 4. Q. Were owners haid by the state or sovernment for the bushes destroyed?
- A. They were not. Practically all owners were willing and anxious to cooperate in protecting our white pine forests. Over 17,500 bushes were removed by owners and the remainder were destroyed by scouts with the permission of the owners.
- 5. Q. Are not the rild black currents as bad as the tame ones?
- A. Extensive experiments and observations by the U. S. Department of Agriculture have shown that the cultivated black current is much worse than the wild black one, which is a different kind.

- 6. Q. How can we recognize cultivated black current bushes? A. The leaves have a strong odor, unpleasant to most people. Their lower surfaces are dotted with minute clistening glands resembling beads. The fruits are black. The leaves are similar in shape and size to those of the cultivated red currents but the points are sharper. 7. Q. Will destroying the cultivated black currents keep the disease out of Oregon? A. It is possible that their eradication may keep it out for some years. Should it finally gain an entrance the absence of black currents will slow up its advance very materially. 8. Q. If the eradication of our cultivated black currents will not keep the blister rust out of our pines permanently are we not throwing away a valuable fruit industry to no avail? . . .
 - - . A. The cultivated black current industry is of very little value to the State. If the disease can be checked until local control methods can be developed in white pine regions we will have gained many times the value of the cultivated black currents.
 - 9. Q. Isn't this black current eradication advocated by the lumbermen and are they not the ones to benefit by it?
 - A. The eradication of cultivated black currents is advocated primarily by the U. S. Department of Agriculture and the State Board of Horticulture. The timber owners should, of course, be interested in it as should all citizens of the State, but protection of the forests against fire and disease is not primarily work for the lumbermen, since the prosperity of the entire state and the nation is inseparably linked to the forests. Standing forests mean sustained yields of lumber for houses and barns and bridges, sustained employment and payrolls. Sustained payrolls mean sustained markets for butter and applies and shoes. Sustained forests mean sustained prosperity.
 - 10. Q. In many parts of western Oregon there are no white pines for stretches of a hundred miles or more. What possible harm could a few patches of cultivated black currents do in such a region?
 - A. This can best be enswered by an observation on what the disease has done. Western Washington is not unlike western Oregon in the scarcity of white pines. Government scouts were unable to locate white pine in Washington within fifty miles of Ilwaco but a very heavy infection was found there on cultivated black currents last fall. What has happened in Washington may happen in Oregon. Remember the disease will travel for many miles from pines to cultivated black currents. It will travel from current to current. The more cultivated black currents we have the faster the disease will travel.
 - 11. Q. Is there danger of the disease invading eastern Oregon? A. Arid conditions do not seem to be an efficient barrier as is shown by the fact that the disease was found in ten places on black currents in the Okanogan region of eastern washington during the summer of .1923.

QUESTIONS AND ANSWERS CONCERNING WHITE PINES

- Q. Are white pines of commercial value?
 A. The most valuable standing timber in the West today is white pine and there are vast quantities of it.
- 2. Q. Do they occur in Oregon?
 - A. There are two kinds of white pine of great commercial value in the state. These are the western white and sugar pines. A third occurs in the high mountains and is not commercially important. It is the so-called white bark pine.
- 3. Q. How may I know a white pine?
 - A. It has five needles in a bundle. All pines with this character in the northwest are white pines.
- 4. Q. Where are the white pines in Oregon?
 - A. A glance at the accompanying sketch map will give you an idea of their general distribution. Over much of this area they are very scattering but they are of commercial importance along the Cascades and in southern Oregon. Folk County also has some commercial white pine timber.
- 5. Q. What is the value of Oregon's white pine timber?
 - A. A government estimate based on the value of the standing timber is \$27,000,000 for the western white and sugar pines.
- 6. Q. Are there not other trees equally as valuable which can be used in reforestation and which are not subject to white pine blister rust?
 - A. No. White pine holds a unique place in the lumber market. White pine lumber always commands a higher price because of its very superior qualities. It also adapts itself to reforestation as it comes in readily after fires and lumbering operations and is a rapid growing tree.





Notices and Release Statements Used in Cultivated Black Currant Work in Oregon Post Office Address of Owner Date Realizing the great danger to Oregon's white and sugar pine forests from the existence within the state of cultivated black currants because they are the chitef means of the spread of the destructive white pine blister rust disease. (have destroyed (have permitted a Federal or State Inspector to destroy cultivated black current bushes as described below, which is the total number on my premises, and as the State has made no provision, I hereby waive any claim for compensation for the bushes destroyed. No. of bushes: Age: Condition Inspector Signature of Owner ***** Notice In compliance with the provisions of Chapter 95 General Laws of Oregon, 1923, entitled MAn act to declare the cultivated black current (Ribes nigrum) and the common barberry (Berberis vulgaris) a public nuisance and providing for their eradication and providing a penalty." you are hereby instructed to uproot and destroy the cultivated black currants on your premises. I shall re-inspect your grounds ____ days from this date to see the the provisions of this law have been complied with. County Fruit Inspector.

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Notice

In compliance with the provisions of Chapter 95, General
Laws of Oregon, 1923, entitled "An act to declare the cultivated
black current (Ribes nigrum) and the common barberry (Berberis
vulgaris) a public nuisance and providing for their eradication
and providing a penalty," I have this day of
1924 uprotted and destroyed black current bushes, the
total number I found on your premises.

Special deputy of Oregon State Board of Horticulture

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JCOPERATIVE BLISTER RUST JONTROL Cregon Agricultural Jollege, Bureau of Plant Industry, U. S. Department of Agriculture.

> Botany Department, C. A. J., Jorvallis, Oregon, June 1, 1924.

The Blister Rust Office, cooperating with the State Board of Horticulture is planning to complete the cradication of the cultivated black currants in Gregon this season. A crew of men will be placed in the field June 15th. These men will locate and cradicate bushes as rapidly as possible.

As this work is being done directly under the authority of the State Board of Horticulture, and in cooperation with its members we are relying on your assistance. Some one of this crew will visit you in the course of the work and plan the campaign to be carried out in your county. Your familiarity with your county will help the crew in locating outlying communities and abandoned homesteads.

Any bushes you can locate and have eradicated prior to the time the crew reaches your county will be that much off the slate and assistance of this kind will materially speed up the work.

I am enclosing a pad of blank notices you may find of service. This form is a proved by Mr. Park, President of the State Board of Horticulture.

Thanking you for your cooperation, I am

Yours very truly,

Junior Pathologist.

TING /K

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UNITED STATES DEPARTMENT OF AGRICULTURE BUREAU OF PLANT INDUSTRY

BLISTER-RUST CONTROL

WHITE PINE BLISTER RUST IN THE NORTHWEST

By S. N. Wyckoff.

* * *

WHAT IT IS

White Pine Blister Rust is a fungous disease which spreads on currant and gooseberry plants and attacks and kills white pines. The western white pine or Idaho white pine, of Montana, Idaho, Oregon and Washington, and the sugar pine of Oregon and California are subject to attack by this disease, and its near approach now threatens valuable forests of these timber trees with destruction.

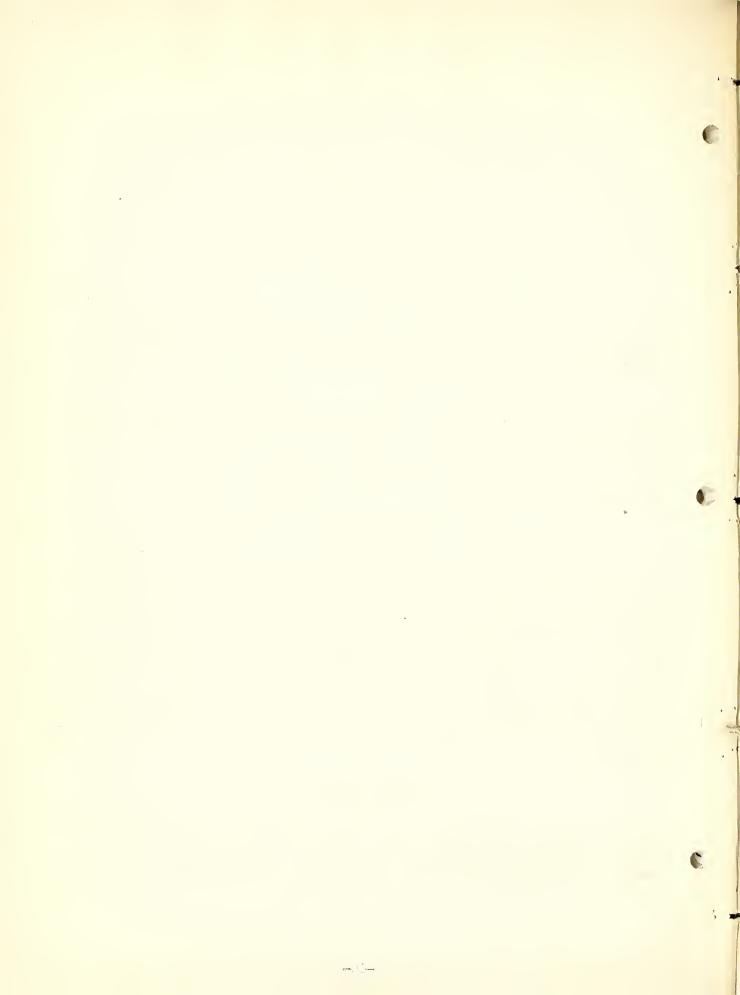
Blister rust was unknowingly brought from Europe into eastern United States over twenty years ago, and since then has established itself in the eastern white pine forests and caused severe losses in stands which have not been protected by local control. It was probably introduced on young white pines imported from Europe and planted at Vancouver, B. C. in 1910 but was not discovered until 1921. The following map will show where it is now known to occur, and the rate at which it is spreading.

HOW IT SPREADS

Blister rust is very peculiar in that it spends part of its life on the pine and part on currants and gooseberries. It does not attack any other trees or shrubs. It generally appears on the bark of white pine trees two or three years after infection takes place. The bark becomes swollen, and in the spring small whitish sacs push their way to the surface. These break and liberate millions of small seed-like bodies known as spores. These spores, as they are blown about by the wind, do not infect other pine trees, but form a rust on the lower leaf surfaces of currant and gooseberry plants. There another type of spore is formed in early summer which infects other currant and gooseberry leaves. In autumn, small brown hair-like bodies are formed on these leaves, which give rise to spores that infect white pines. On the pines, the disease lives in and under the bark, and kills the tree by girdling it.

VALUES AT STAKE

The present stand of commercial five-needle pines in the United States is 78,571 million board feet. Approximately three-fourths of this timber, 57,071 million board feet, is in the western forests. The two important commercial species are western white pine and sugar pine. These are the most valuable forest trees found in the West. White and sugar pines



to 1918, more than one-third of the lumber produced was western white pine, and in California during the same period one-tenth of the lumber produced was sugar pine. The lumber manufactured from these pines is more valuable than that of other species; therefore these proportions are greater in dollar value than in board feet. The blister rust is already firmly established in British Columbia and has spread into northern and western Washington. The continued spread of this disease may eliminate our white and sugar pine crops of the future unless we are successful in controlling this disease. The loss of this timber would be felt by everyone in the West, whether or not he owns timber, because many articles of common daily use, such as matches, doors, windows, frames, mouldings, and many parts of farm machinery are better made from white pine than from any other lumber and large numbers of wage earners are sustained by these industries.

COMBATIVE MEASURES

The United States Department of Agriculture, in cooperation with western State officials and others interested in the preservation of white pine, is endeavoring to delay the spread of this disease and devise methods for its control. Extensive experimental work is now under way to improve methods of protecting white pine timber and young growth by the removal of all wild currant and gooseberry plants from the woods. Also a general program of eradication of cultivated black currants is being conducted in the western pine growing states.

DELAYING THE SPREAD OF THE RUST

(a) by eradication of cultivated black currents.

Cultivated black currants, sometimes called the European or English black currant, are more susceptible to white-pine blister rust than any other type of currant or gooseberry. This species is the most active agent concerned in the long-distance spread and establishment of white pine blister rust. That is, cultivated black currant plants become heavily infected at great distances from diseased pines, and because of their extreme susceptibility to the rust, establish centers of infection from which the disease spreads rapidly to other kinds of currants, gooseberries, and white pines. Compared to cultivated black currants, other species of currants and gooseberries are relatively resistant to blister rust. However, in the course of a season the disease may spread on any type of currant or gooseberry from the original black currant center, because of successive cycles of the summer stage of the rust.

The United States Department of Agriculture regards the cultivated black current a distinct menace to the white pine timber supply of the country. It is a menace not only to the thousands of farm owners who grow white pine in their woodlots or in their shelter belts and dooryards, but also to all citizens, since all use white pine lumber directly or indirectly. The common cultivated black current is so serious a danger to the production of white pine timber as to make

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this currant a public nuisance in all states where white (five needled) pines grow. Because of these facts the United States Department of Agriculture is opposed to the growing of this species of currant (Ribes nigrum) anywhere in the United States and recommends that State authorities, nurserymen, and growers take active steps to accomplish its elimination from the Pacific, Rocky Mountain, Atlantic, Appalachian, Ohio Valley, upper Mississippi Valley, and Lake States. The growing of cultivated black currants, in home gardens as well as in nurseries and commercial plantings, should be entirely abandoned throughout these states, because of the great importance of the white pines, and the relatively small value of the black currants. There are some individuals to whom the loss of cultivated black currants will mean a measurable sacrifice. But the menace of the blister rust to our white pine forests demands this sacrifice, since the spread of the rust cannot be checked in any other way.

(b) by preventing unlawful movement of host plants.

Quarantine laws have been enacted by the Federal Government and the several States which are designed to prevent the further spread of blister rust by shipment of diseased plants. These quarantines prohibit (1) the shipment of all white pines, currants and gooseberries into the United States from any foreign country; (2) the shipment of these plants into the West from all states east of and including Minnesota, Iowa, Missouri, Arkansas, and Louisiana; and (3) prohibit their shipment out of the State of Washington.

HOW YOU CAN HELP

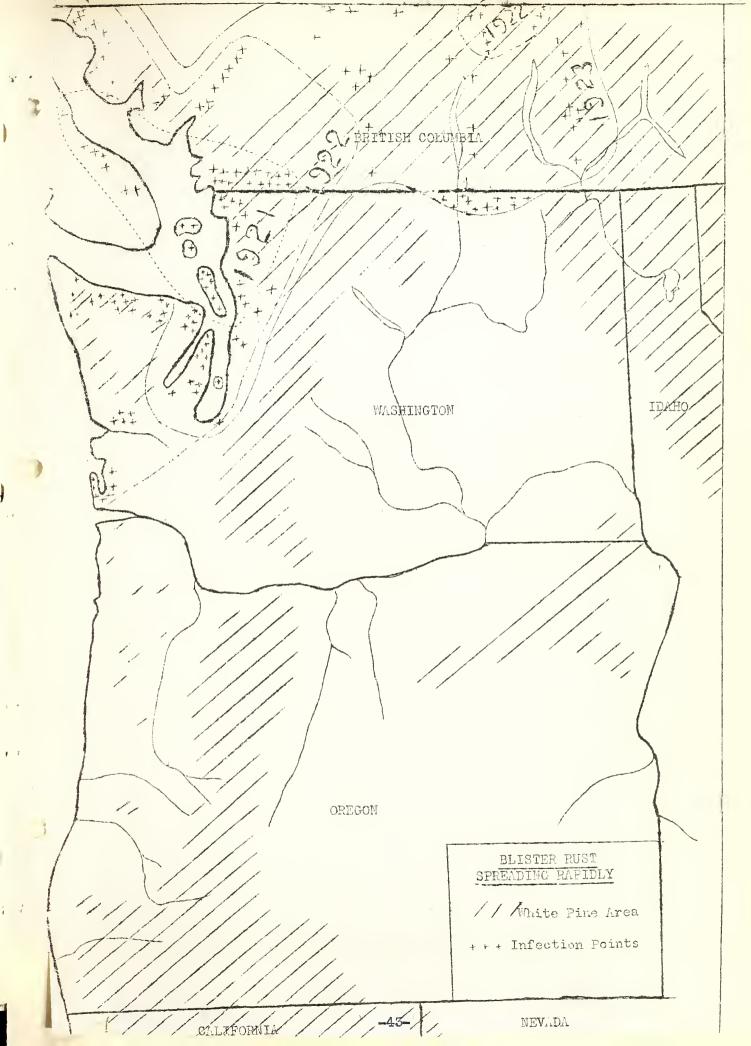
Everyone in the West can and should help in fighting the blister rust. They can help in the following ways:

- 1. By destroying any cultivated black currants which they may have in their gardens.
- 2. By helping to enforce the quarantine laws listed above.
- 3. By watching for the disease, as described here, on currants, gooseberries, or white pines, If anything suspicious is found, send it to L. N. Goodding, in care Botany Department, Oregon Agricultural College, Corvallis, Oregon; or the Office of Blister Rust Control, 618 Realty Bldg., Spokane, Washington.

For further information apply to L. N. Goodding, in care Botany Department, Oregon Agricultural College; State Forester, Salem, Oregon; or S. N. Wyckoff, 618 Realty Building, Spokane, Washington.

Issued by Office of Blister Rust Control
Bureau of Plant Industry,
U. S. Department of Agriculture.
September - 1924.

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1.15. Cultivated Black Currant Eradication in California

In August, 1924 a cooperative agreement between the California State Department of Agriculture, the California State Board of Forestry and the B. P. I. was drawn up, Mr. G. A. Root, of this office permanently assigned to work in this state, and cultivated black current eradication work started. This work has been carried on continuously since last August.

The following report by Mr. Root will give the results of this past season's work in California.

White Pine Blister Rust Control Work In California, 1924

Active work in the control of the White Pine Blister Rust took definite form, July 23, when the State Department of Agriculture of California approved a cooperative agreement with the Office of Blister Rust Control of the Federal Bureau of Plant Industry and the California State Board of Forestry. The agreement is as follows:

MIMORANDUL OF UNDERSTANDING BETWEEN THE CALIFORNIA DEPARTMENT OF AGRICULTURE, THE CALIFORNIA STATE BOARD OF FORESTRY, AND THE BUREAU OF PLANT INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE, RELATIVE TO COOPERATIVE WORK ON THE CONTROL OF THE WHITE PINE BLISTER RUST IN CALIFORNIA.

EFFECTIVE JULY I., 1924, to JUNE 30, 1925.

The object of this memorandum of understanding shall be to facilitate the prompt location and eradication and effective control of white pine blister rust in California in view of the threatened destruction of timber throughout the West as a result of the presence of this disease in the west, and the danger of its further spread by natural dissemination or quarantine violation.

It is agreed that the California Department of Agriculture and the California State Board of Forestry, parties of the first part, and the Bureau of Plant Industry, United States Department of Agriculture, party of the second part, shall cooperate to the above ends in accordance with the following plan:

1. The California Department of Agriculture and the Bureau of Plant Industry shall cooperate with the Federal Horticultural Board in the strict enforcement of State and Federal blister rust quarantines now in effect

1.15. Orltiv .ed Maga Jureant Bradication in Making make

In ingest, 1924 a cooperative equation between the saliforming clube Department of Agricultes, the Salidonnin Street of Domestry and the D. I. I. T. was drawn we, in the lock, of this office personently assigned to note in this retate, and caltivated black carrant exaction work attaction. This work has been carried as each translation of the translation work.

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I. The California lepart sat of grieulture and the stream of Calubtant Industry shall doon whe will the federal Icerticaltural Board in the strict onforcement of state and rederal blister ast matchines and in affect

or which may be promulgated. The California Department of Agriculture and the Bureau of Plant Industry shall each pay the salaries and expenses and direct the work of one of more men who shall, during the proper season, inspect plant shipments for violations of these blister rust quarantines.

- 2. The Bureau of Plant Industry shall, for the field season of 1924, pay the salaries and expenses of one or more men, who shall do the necessary scouting for the disease and the locating of cultivated black currants in California.
- 3. The California Department of Agriculture shall use its regular employees so far as their other duties permit, and shall direct the work of its cooperating horticultural officials, so far as their other duties permit, in systematically locating cultivated black currents and infected blister rust host plants; in scouting for the blister rust; in inspecting nurseries for this disease and in enforcing State and Federal blister rust quarantines. It is recognized that the California Department of Agriculture has no special appropriation for blister rust control, and that therefore such blister rust control work as is performed by the employees of the California Department of Agriculture and its cooperating horticultural officials will be done in connection with their other duties. Such work will aggregate approximately 800mandays, representing a total expenditure of approximately \$4000.00 for the control of this disease during the period covered by this agreement. The expenditures of the Bureau of Plant Industry, as indicated in the previous paragraphs, will aggregate approximately \$4000.00, during the period covered by this agreement, but none of the Federal funds shall be spent in compensation for plants destroyed in control work.
- 4. The California State Board of Forestry shall use its regular employees, so far as their other duties permit, in systematically locating cultivated black currants and in scouting for the blister rust on its wild and cultivated host plants. Such work will aggregate total expenditure by the California State Board of Forestry of approximately \$1500.00 for the control of this disease during the period covered by this agreement.
- 5. All official records of the work performed under this agreement shall be open to inspection by any or all parties to this agreement. All findings of the blister rust made by any party to this agreement shall be promptly reported to all other parties to this agreement. All specimens collected by any part to this agreement, which are suspected to be

- or vaid as se remal, when a suffer is oper that of Aprical ture and are Puresu of lant below the shall each pa the selaries and expenses and direct the work of one of more mental of shall, auring the proper season, inspect plant ship entrant or vicinitions of these blister rust quarent ineq.
 - 2. The Bureau of lant Industry shall, for the field setson of 1524, pay the salaries and errouses of one or nore men, who shall do the necessary scouting for the disesset and the locating of oultivated black currents in talifornia.
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- 5. All official recomis of the continuation of the continuation this agreement. All findings of the interpret of all parties to this agreement. All findings of the interpret of the by any part, to this agreement shall be promitty reperted to all other parties to this agreement. All specimens collected by any part to this agreement, which are suspected to be

infected with blister rust, shall be submitted to the Bureau of Plant Industry for final determination. The Bureau of Plant Industry shall give such technical information to the employees of the parties to this agreement as will enable them to recognize the several stages of the disease.

6. It is understood that the Bureau of Plant Industry shall be primarily responsible for scouting and locating the blister rust in California, and for furnishing technical information on its control, but that the Federal Government has no authority to destroy private or State property and therefore that the California Department of Agriculture shall be wholly responsible for destroying such pines, currant and gooseberry plants as my be found necessary in order to control the spread of this disease in California, including plants shipped in violation of State and Federal blister rust quarantines.

7. This memorandum of understanding shall take effect July 1, 1924, and continue in force until June 30, 1925, or until previously terminated by mutual consent of the parties to this agreement.

Signatures

7/22/24	G. H. Hecke
Date	Director, California Department of Agriculture
1.0	
7/24/24	M. B. Pratt
Date	State Forestor
8/12/24	Wm. A. Taylor
Date	Chief, Bureau of Plant Industry, United States
	Department of Agriculture.

To more clearly define the purpose of the agreement the following working plan was devised:

Blister Rust Control Work in California
Season of 1924.

Purpose: To secure the elimination of cultivated black currants in the northern counties of California, in oreder to delay the rapid spread of blister rust into the sugar pine regions; (2) To

infected with blister rust, shall be submitted to the Bureau of Plant Industry for final determination. The Bureau of lant Industry shall give such technical information to the employees of the parties to this agreement as will emble them to recognize the ceveral stages of the disease.

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	State Porestor		Date
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Blister dust Control Nors in Balifornia Season of 1924.

rangose: lo secure the elimination of cultivated black currents in the northern counties of balkornia, in oreder to delag the ragid operad of blister rust into the sugar pine regions; (2) lo

conduct general scouting in northern California, to determine if blister rust is now present in this state; (3) To acquaint the public with the possibilities of serious damage by blister rust, the values of sugar pine timber threatened by this disease, and the part played by the cultivated black currants in its dissemination,

Area covered: For the season of 1924, field work will be conducted in Modoc, Lassen, Siskiyou; Shasta, Trinity, Del Norte and Humboldt Counties, or as many of these counties as possible. General educational work will be conducted over the entire state.

Organization of work: This work will be conducted by the Office of Blister Rust Control, Bureau of Plant Industry, the California Department of Agriculture and its cooperating county horticultural officials, and the California State Board of Forestry.

The Office of Blister Rust Control will employ four men for two months to work under the direction of Mr. G. A. Root, who will conduct the field work in northern California.

The California Department of Agriculture and the State Board of Forestry will instruct their employees and cooperators to assist in this field work in every feasible way.

The field work will be conducted upon the basis of county units. In each county, Mr. Moot will procure the proper maps and property records and will outline the work for his assistants, In outlining this work he will confer with and secure the assistance of any employees of the State Department of Agriculture, the State Board of Forestry, and the County Horticultural Commissioners.

After the work is properly organized, a thorough canvass of each county will be made by Mr. Root and his assistants to locate all plantings of cultivated black currents.

When any such plantings are found, these men will endeavor to secure their eradication through voluntary action on the part of the owner. If, after explaining the disease to the owner of the plants, he is willing to permit their eradication, his signature to the fabbowing statement will be secured.

Date
In order to assist in the control of the white pine
blister rust, I hereby givecultivated black
currant bushes to the proper agents of the United States
Department of Agriculture or the State of California, in
order that theses plants may be destroyed.
Hame

Address

ecndest general scouting in northern lationnie, to detem in if blister rust is now precent in this state; (5) If acquaint the public with the possibilities of serious damage by blister rust, the values of sugar pine timber threatened by this disease, and the part played by the cultivated black surrants in its dissemination,

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No plants will be removed until such a statement is signed by the owner.

Wherever it is compatible with their other duties, each County Horticultural Commissioner will assume reponsibility for the location and eradication of the cultivated black currants in a designated part of his county.

An educational program will be conducted by Mr. Root in each county in which field work is being carried on. This program will consist of the use of exhibits and posters, publicity in local newspapers, talks before local meetings, and the use of blister rust motion picture film.

Mr. Root will confer with the State Director of Extension, at Berkeley, to secure the assistance of the County Agents. No field work will be requested from the county Agents, but they will be requested to support the cultivated black currant program. They will be supplied with literature and exhibits, explaining the disease andthe work.

Mr. Root will confer with all rangers and other employees of the State Board of Forestry in counties where field work is being conducted. These men will assist the work in every way possible.

During the winter months, Mr. Root will carry on, alon,e, all possible field work, general educational work, and will further perfect the organization of his work for the field season of 1925.

Results of the Beason's Work

Black Current Bradication

General scouting and eradication of black current bushes was started in northern California with two two-men crews on August 15. The men continued work until October 15. One man was retained until December 20, as this type of work could be carried on in certain parts of the State until a late date.

The usual method of eradication was carried on. As there is no law at present requiring the removal of these bushes, the scouts had to rely upon the good will of the owners. The following table gives the results of the field season of 1924 from August 15 to December 20, 1924.

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County	-	radicated ings:Plants	-	radicated ngs:Plants	Plant	Total ings:Plants	
Lassen	: 9	. 45	:	:	9	. 45	
Modoc	: 5	: 16	:	O Onta Onta	: 5	16	
Shasta	: 6	: 14		* ************************************	: 6	14	
Siskiyou	: 5	: 38	a angles	2 Januariana	5	38	
Trinity	2	8		:	2	8	
Del Norte	4	13	a number	9 000-300	4	13	
#Humboldt:	190	:1454	5	33	:195	:1487	
Total	221	:1588	* *5	: :*33	: 226	1621	

#Not yet completed

*Still pending-further efforts are being made to secure their removal.

The above number of black currants eradicated represents the number destroyed through voluntary action on the part of the owners. In order to promote a better feeling and perhaps leave a more favorable impression of our work "Letters of Appreciation" were sent out to all black currant owners who consented to the removal of their bushes. These were not sent out without the desired effect for it was afterwards learned that in one instance such a letter practically saved the replanting of a portion of twelve of the largest bushes found this season. The letter is as follows:

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry

Sacramento, California

Dear Sir:

3 1 1 1 1 1 1 1 1

It has been reported to me by one of our field men that cultivated black currants were found at your place, and that you gave consent to their removal to assist in protecting the sugar pine forests of California from damage by White Pine Blister Rust. We greatly appreciate your action in this matter and take this opportunity to thank you.

In the control of the White Pine Blister Rust, of which you no doubt have read or heard, one of the most important

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*utill angling further efforts are bein made to secure their removal.

The number destrants of black currents endicated represents the number destrants through voluntary action on the part of the owners. In order to promote a better feeling and perhaps leave a nove favorable inpression of our vert "Letters of Appreciation" where sout out to all black current owners who concetted to the removal of their hudes. These were not sent out without the downed offect for it was afterwards learned that in one instance such a largest for a saved the replanting of a portion of twolve of the largest bushes found this se sen. The letter is as follows:

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Sacramento, Balifornia

: The said

It has been compreted to me by one of our field men that call divided to a companie when found at your place, and that you consist to their removal to assist in proceeding the superfine for as of Thiomia from wanage by hite line alictor art. To get the appreciate your action in this matter and save a loopnortunity to them. You

In the control of the Thite Sine Blitter knot, of this on no devot knye read or heard, one of the noot important

methods is the eradication of the cultivated black currant. This particular variety takes the disease from great distances and is instrumental in spreading it far and wide. It is much more susceptible to the rust than any other wild or cultivated variety, hence its removal will prevent or greatly retard the spread of the disease to non-infected territory.

Should by chance the bush or bushes start to grow again, no doubt we can rely on you to remove the sprouts. It is sometimes very difficult to get all the roots.

In the vest expanse of territory which the field men have to cover, it is possible that some places may have been missed. We would be pleased to have you tell us of any other plantings of black currents in your neighborhood.

Please address all information to

Geo. A. Root, Asst. Pathologist % State Department of Agriculture, Sacramento, California

Splendid cooperation was obtained from the various agencies. The following is a copy of a letter sent to the Horticultural Commissioners by W. C. Jacobsen, of the State Department of Agriculture:

STATE DEPARTMENT OF AGRICULTURE

G. H. Hecke, Director

Sacramento

Sacramento, California August 5, 1924

Mr. F. H. Taylor County Horticultural Commissioner Susanville, California

Dear Mr. Taylor:

This will serve to introduce Mr. G. A. Root, in charge of the Blister Rust Control Work in California.

Mr. Root is a representative of the office of the Pine Blister Rust Control and is anxious to conduct the program outlined to you in a previous letter in accordance with the general work that is being done throughout Northern California

nethold is the eradication of the caltimated place current. This particular variety takes the discuss from great discusses and is instrumental in approximg it for and wide. It is much more susceptible so the rust than any other wild or smitty tod verify, hence is resonably with proximt or greatly reterial the cores of the discuss to non-infected territory.

Should by chance the bush or bushus thurt to processing in ... can bushus the processing in a cast we can red, on you to remove the growth as were difficult to get all the growth.

In the v st expanse of territory which he fille man love to cover, it is jourible that some placers and large been missed. 'e would be pleased to have jour tell as of my other jameing of black care ats in your neighborhood.

Please address all information to

Rec. A. Root, Asst. Puthologist Juste Lepartherit of Agriculture, Lacramento, Jalifornia

splendid cooperation as obtained from the various agencies. The following is a cope of a letter and to the forticultural Commissioners by W. C. Pacobsen, of the State Deportuent of Agriculture:

STATO DEPARTM AND OF AGRICULATURE G. H. Focke, Director

Jacruserto, billomia

in. 1. H. La lor County Morticultural Compissioner Susanville, Elifornia

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This will sorve to introduce ir. (. . . 500), in charge of the Hister must Control fork in California.

If. Noot is a representative of the office of the office of the office of the office functions to conduct the program ontlined to you in a previous letter is scoordance with the general work that is being done throughout Northern California

and the Northwest in stemming the spread of this disease among pines of the white pine variety which, in this case, resolves itself largely into being a protection of sugar pines.

The State Department of Agriculture will appreciate any assistance you can render Mr. Root.

Yours very truly,
DEPARTMENT OF AGRICULTURE

(Signed) W. C. Jacobsen, Chief,
Bureau of Plant Quarantine
And Pest Control.

Mr. M. B. Pratt, State Forester, sent out the following notation to his men:

CALIFORNIA STATE BOARD OF FORESTRY

SACRAMENTO

August 4, 1924

District Fire Rangers-

This will introduce Mr. G. A. Root, Specialist with the Bureau of Plant Industry, in Charge of Blister Rust Control Work in California.

Please give Mr. Root any assistance which you can while he is in your district. If it is possible for you to take him to places where he may desire to go, I wish you would do so providing it will not interfere with you duties.

Yours very truly,

(Signed) M. B. Pratt

STATE FORESTER.

Professor Crocheron of the Cooperative Extension Work of California, through his Assistant Mr. C. W. Rubel, issued the following letter to the Farm Advisors:

and the Morthwest in sterming the spread of this disease among pines of the white pine variety which, in this case, resolves itself largely into being a protection of sagar pines.

The state Department of a ristiture will appreciate any assistance you can render Ir. Root.

Yours very truly,

(Signed) W. O. Jacobsen, Chief, Bureau of Plant Quarantine and Peat Control.

III. II. P. Pratt, State Forester, sent out the Following

CALLFORNIA STATE BOALD OF LORESTAY

BACRILLETTO

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Yours very truly.

(Signed) IL 3. Pratt

STAT : FORESTER.

Professor Grocheron of the Cooperative Extension ork of California, through his Assistant Mr. C. .. Endel, issued the Colloving letter to the Parm Ldvisors:

August 9, 1924.

Mr. A. L. Campbell,
Farm Advisor,
Court House,
Redding, California

Dear Campbell:

You are probably aware of the efforts of the U. S. Department of Agriculture to control as far as possible the spread of White Pine Blister Rust which is so injurious to our forests. Mr. George A. Root, Assistant Pathologist in the Bureau of Plant Industry, is carrying on some control work in California this year in cooperation with the State Department of Agriculture. Mr. Root will visit Lassen County very shortly and will desire to consult with you regarding the work in that section. While perhaps there is not a great deal of actual work that you could do, you can probably be of great assistance in helping Mr. Root plan the work in that section and in supplying information to the people concerned through the medium of the Farm Bureau and other channels at your command. You will not be expected to carry on any field work in this campaign but we will be very glad indeed to have you support Mr. Root in every way that you possibly can.

Very truly yours.

Assistant State Leader of Farm Advisors,
Northern Counties.

The County Horticultural Commissioners and members of the U. S. Forest Service gave valuable aid to the Blister Rust force in helping to locate many of the black currant plantings in the more remote sections of each county or forest district.

Education Work

This logically followed the course of the black currant eradication. Exhibits were displayed at the California State Fair in Sacramento, the Adin Fair in Lassen County, the Inter-mountain Fair at McArthur in Shasta County and the Shasta County Fair in Anderson. It is hoped next season to have an exhibit at a fair in each county if possible.

Newspaper articles were inserted in 15 local papers throughout the seven counties as well as in several of the larger newspapers elsewhere throughout the State. The Government Blister Rust film was shown in ten cities or towns. Several of the counties have but

Angr. . Jour MA

Ir. .. L. Jambell, Fur a visor, Court Nove, Redding, California

Dear Campbell:

Very truly Jours,

Assistant tate leader of Tarm Advisors, orthern Tounties.

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two show houses which put on pictures but once a week. The motion pictures are undoubtedly one of the best methods of presenting to the public, the Blister Rust in detail and the potential menace of the disease to California sugar pines.

Posters and bulletins were displayed and distributed throughout the working area, including a timely letter sent out from the main office in Spokane, Washington as follows:

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Posters and bulletins were displayed and distributed throughout the norking area, including a tirol, letter sent out from the main office in Spokane, Lamington as follows:

UNITED STATES DEPARTMENT OF AGRICULTURE BUREAU OF PLANT INDUSTRY

ELISTER-RUST CONTROL

WHITE PINE BLISTER RUST IN THE NORTHWEST

By S. N. Wyckoff.

* * *

WHAT IT IS

White Pine Blister Rust is a fungous disease which spreads on currant and gooseberry plants and attacks and kills white pines. The Western white pine or Idaho white pine, and the sugar pine of California are subject to attack by this disease, and its near approach now threatens valuable forests of these timber trees with destruction.

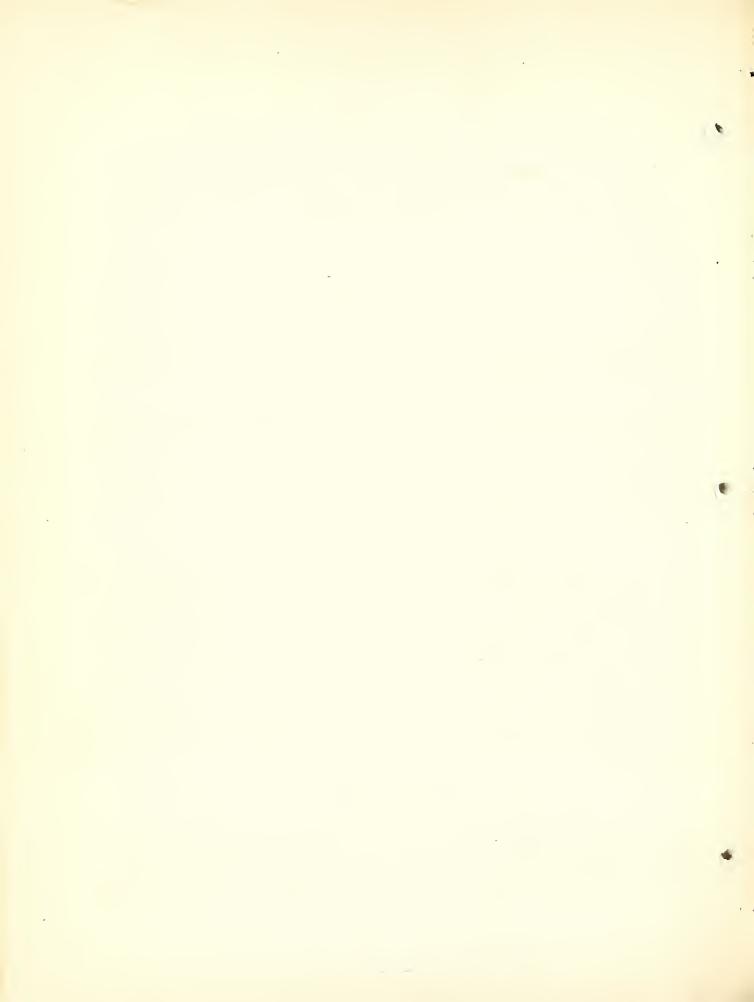
Blister rust was unknowingly brought from Europe into eastern United States over twenty years ago, and since then has established itself in the eastern white pine forests and caused severe losses in stands which have not been protected by local control. It was probably introduced on young white pines imported from Europe and planted at Vancouver, B. C. in 1910 but was not discovered until 1921. The following map will show where it is now known to occur, and the rate at which it is spreading.

HOW IT SPREADS

Blister rust is very peculiar in that it spends part of its life on the pine and part on currants and gooseberries. It does not attack any other trees or shrubs. It generally appears on the bark of white pine trees two or three years after infection takes place. The bark becomes swollen, and in the spring small whitish sacs push their way to the surface. These break and liberate millions of small seed-like bodies known as spores. These spores, as they are blown about by the wind, do not infect other pine trees, but form a rust on the lower leaf surfaces of currant and gooseberry plants. There another type of spore is formed in early summer which infects other currant and gooseberry leaves. In autumn, small brown hair-like bodies are formed on these leaves, which give rise to spores that infect white pines. On the pines, the disease lives in and under the bark, and kills the tree by girdling it.

VALUES AT STAKE

The present stand of commercial five-needle pines in the United States is 78,571 million board feet. Approximately three-fourths of this timber, 57,071 million board feet, is in the western forests. The two important commercial species are western white pine and sugar pine. These are the most valuable forest trees found in the West. In Idaho, from 1914



to 1918, more than one-third of the lumber produced was western white pine, and in California during the same period one-tenth of the lumber produced was sugar pine. The lumber manufactured from these pines is more valuable than that of other species; therefore these proportions are greater in dollar value than in board feet. The blister rust is already firmly established in British Columbia and has spread into northern and western Washington. The continued spread of this disease may eliminate our white and sugar pine crops of the future unless we are successful in controlling this disease. The loss of this timber would be felt by everyone in the West, whether or not he owns timber, because many articles of common daily use, such as matches, doors, windows, frames, mouldings, and many parts of farm machinery are better made from white pine than from any other lumber and large numbers of wage earners are sustained by these industries.

COMBATIVE MEASURES

The United States Department of Agriculture, in cooperation with western State officials and others interested in the preservation of white pine, is endeavoring to delay the spread of this disease and devise methods for its control. Extensive experimental work is now under way to improve methods of protecting white pine timber and young growth by the removal of all wild currant and gooseberry plants from the woods. Also a general program of eradication of cultivated black currants is being conducted in the western pine growing states.

DELAYING THE SPREAD OF THE RUST

(a) by eradication of cultivated black currents.

Cultivated black currants, sometimes called the European or English black currant, are more susceptible to white-pine blister rust than any other type of currant or gooseberry. This species is the most active agent concerned in the long-distance spread and establishment of white pine blister rust. That is, cultivated black currant plants become heavily infected at great distances from diseased pines, and because of their extreme susceptibility to the rust, establish centers of infection from which the disease spreads rapidly to other kinds of currants, gooseberries, and white pines. Compared to cultivated black currants, other species of currants and gooseberries are relatively resistant to blister rust. However, in the course of a season the disease may spread on any type of currant or gooseberry from the original black currant center, because of successive cycles of the summer stage of the rust.

The United States Department of Agriculture regards the cultivated black current a distinct menace to the white pine timber supply of the country. It is a menace not only to the thousands of farm owners who grow white pine in their woodlots or in their shelter belts and dooryards, but also to all citizens, since all use white pine lumber directly or indirectly. The common cultivated black current is so serious a danger to the production of white pine timber as to make

this currant a public nuisance in all states where white (five needled) pines grow. Because of these facts the United States Department of Agriculture is opposed to the growing of this species of currant (Ribes nigrum) anywhere in the United States and recommends that State authorities, nurserymen, and growers take active steps to accomplish its elimination from the Pacific, Rocky Mountain, Atlantic, Appalachian, Ohio Valley, upper Mississippi Valley, and Lake States. The growing of cultivated black currants, in home gardens as well as in nurseries and commercial plantings, should be entirely abandoned throughout these states, because of the great importance of the white pines, and the relatively small value of the black currants. There are some individuals to whom the loss of cultivated black currants will mean a measurable sacrifice. But the menace of the blister rust to our white pine forests demands this sacrifice, since the spread of the rust cannot be checked in any other way.

(b) by preventing unlawful movement of host plants.

Quarantine laws have been enacted by the Federal Government and the several States which are designed to prevent the further spread of blister rust by shipment of diseased plants. These quarantines prohibit (1) the shipment of all white pines, currants and gooseberries into the United States from any foreign country; (2) the shipment of these plants into the West from all states east of and including Minnesota, Iowa, Missouri, Arkansas, and Louisiana; and (3) prohibit their shipment out of the State of Washington.

HOW YOU CAN HELP

Everyone in the West can and should help in fighting the blister rust. They can help in the following ways:

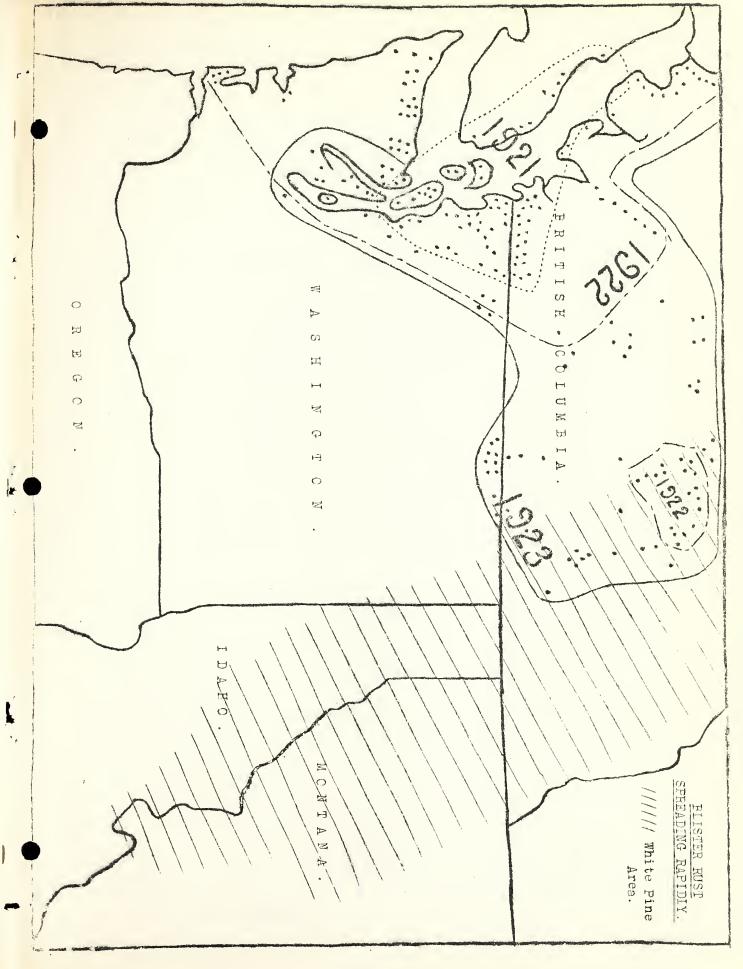
- l. By destroying any cultivated black currants which they may have in their gardens.
- 2. By helping to enforce the quarantine laws listed above.
- 3. By watching for the disease, as described here, on currants, gooseberries, or white pines. If anything suspicious is found, send it to your State Department of Agriculture, or the Office of Blister Rust Control, 618 Realty Bldg., Spokane, Washington.

For further information apply to State Forester, Sacramento, California; State Department of Agriculture, Sacramento, California; or S. N. Wyckoff, 618 Realty Building, Spokane, Washington.

Issued by Office of Blister Rust Control,
Bureau of Plant Industry,

U. S. Department of Agriculture. September - 1924.

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Scouting for the Disease

Bearing in mind the importance of finding the disease if present, a careful inspection of the black current plantings was made. These bushes are extremely good indicators of the presence of the rust. Wild currents and gooseberries were inspected here and there throughout the eradication area as well as many sugar pines. No sign of the disease was found on either host plant.

Nursery Inspection

The importance of the nurseries as a source of supply of black currants is of course obvious. They were inspected for Blister Rust hosts in conjunction with the eradication work. In order to find the status of each nursery in the State a form letter was sent to all as follows:

UNITED STATES DEPARTMENT OF AGRICULTURE Burueau of Plant Industry

Saczamento, Caifornia

Dear Sir:

The renewal of active work in this state on Thite Pine Blister Rust Control, took definite form when a cooperative agreement was made among the State Department of Agriculture, the State Board of Forestry and the U. S. Bureau of Plant Industry, calling for the eradication of the cultivated English black currant (Ribes Nigrum) in California. Field work was started in northern California on August 15 and over a period covering two months, six counties have been scouted and the black currants removed. It is one of the first measures employed to retard the possible entry of the White Pine Blister Rust into California. A general program of eradication of these bushes is being conducted in the western pine growing states. It is a tremendous job but it can be done.

You will doubtless remember that during the summer of 1922, the nurserymen of California were asked for information concerning the number of cultivated English black currants in their possession. An admirable response was at that time received and much valuable information was obtained. A lapse of two years time must necessarily bring many changes or corrections.

I am enclosing herewith an addressed postcard which we should like to have you fill out and return. No postage is required. This information concerning the cultivated black currents in your nursery will be of great value to us. Even if you have none of

Scouting for the missure

Bearing in all a time another and a series of finity also discrete the plantings of the black care at plantings if present, a careful inspection of the black care and indicators of the was made of the rust. The careants and goo clamics were inspected here and thore throughout the cradicalian tree as nell as may make the pines. In sign of the discass we found on either hest plant.

Lursory Inspection

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these plants in stock please fill out the card and mail to us.

Many murserymen in California have already destroyed their black currants. Will you not do the same? The nurseries of Idaho, Washington and Oregon have destroyed all their cultivated black currant bushes. The black currants destroyed by nurseries of the latter State alone total about 16,000.

Because of its tremendous values in present and potential sugar pine timber, California has really more at stake than Oregon or Washington. The destruction of your bushes will constitute active cooperation on your part in the struggle to protect and perpetuate the sugar pine forests of California.

Thanking you for whatever information you may send I am,

Very truly yours,

(Signed) George A. Root,

Assistant Pathologist

Much desirable information can be obtained in this way. Already a good response has been made and several of the nurseries have destroyed their black currants. Indications point to a small percentage of the nurseries possessing these bushes. It is hoped that a personal visit can be made to many of them as the work progresses to other counties.

Summary

Black currents were eradicated in nearly seven counties. The total number of plantings found was 226, consisting of 1621 bushes. Considering the area covered and the number of bushes removed it can be seen that the public in general took a favorable attitude toward our working policy. An inspection of these bushes throughout the northern part of the State revealed no signs of the Rust.

Future Plans and Work

Attending the success of the first season's work of eradication it has seemed advisable to include a much larger territory for the season of 1925. It is proposed that the eradication work be carried on in the following twelve counties: Mendocino, Lake, Tehama, Glenn, Colusa, Sutter, Butte, Plumas, Yuba, Sierra, Nevada and Placer and in as many more as time and finances will permit. With the completion of such an area practically one third

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of the State will be covered. (See map at end of Report).

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A Black Current Prohibitory Law

A State law requiring the removal and non-propagation of the cultivated English black currants will in all probability be introduced into the next Legislature. Such laws are now in force in Idaho and Oregon. It seems desirable to have such a Statute. It makes it possible to remove all plantings of black currants. In several instances, owners of these bushes have withheld their removal pending a law compelling them to do so. In most cases, however, the best results can be obtained by assuming that the owners can be of service to the work by the voluntary removal of their bushes.

A Sugar Pine Study

The Bottom College College

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Plans are being considered to have the U. S. Forest Service and the Forestry Department of the University of California make a study of sugar pine reproduction with special attention to the number and species of wild currants and gooseberries growing in the area. This phase of the work is essential in that it will enable one to more successfully combat the disease should it happen to become established in sugar pine regions.

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General Notes

The field work in the eradication of the cultivated English black currants terminated in Humboldt County on December 20. This ended the field season for 1924.

The number of bushes found from December 1 to 20 is as follows:

No. Plantings eradicated --- 104

No. Bushes eradicated----755

No. Plantings not eradicated-4

No. Bushes not eradicated --- 24

The total then found is 108 plantings comprising 779 bushes.

Criticisms of the Blister Rust Film

Three of the four scouts in California this past season had no particular criticism to make. Mr. Henry suggested that the film could be improved by definitely stating where the disease is located on the Ribes bushes. The only indication that the spectator has of this is the few moments in the picture where the Federal agent shows the underside of the leaves to the owner of the bushes. A close-up of a diseased Ribes leaf showing the uredinia and telia on the underside would clarify the doubt now existing as to the part played by the Ribes host. The diseased pine twig is shown, why not the Ribes leaf?

Disinterested parties have pointed out that the scenic views as an introduction are too long, i.e..too much of the picture is devoted to scenery. This may be true to the audiences of California.

The writer has no particular criticism to make except that he corroborates Mr. Henry's regarding the introduction of a diseased Ribes leaf.

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1.2 Inspection of Transported Host Plants in Cooperation with the Federal Horticultural Board

Inspection work during the spring of 1924 extended over the period of March and April, the exact period of inspection at each point being shown in the table showing the plant shipments inspected. One inspector was located at each of the following points: Portland and Pendleton, Oregon, Pasco, Seattle and Tacoma, Washington. Two inspectors were located at Spokane. The table entitled "Plant Shipments Inspected" gives the summary of the plant shipments which were inspected and the violations that were found at each inspection point. This table is followed by detailed tables showing the plant shipments that were inspected at each inspection point each day.

The table entitled "Quarantine Violations" gives an analysis of all violations which were interupted by our inspectors as well as those reported from other sources.

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Plant Shipments Inspected - Spring 1924.

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Report on Inspection in Mail Cars of Mursery Stock Travelling by Parcel Post

As the inspection work has developed some inspection work in mail cars has been done. This work has been of two types: First, inspection in mail cars that were at their initial point or at their destination and were being loaded or unloaded, Second, inspection in messenger cars which were passing through an inspection point.

According to the letter of Feb. 14, 1921, of the Postmaster General "Packages in through cars or in mail bags which are not opened in the terminal railway post offices cannot be inspected". This instruction on the limitation of our inspection work has been carefully observed.

In the inspection of nursery stock in cars that were being loaded or unloaded at the railway mail terminal we have been following this policy ever since quarantine work was established and this situation appears to be covered in the general letter of instructions of the Postmaster General of Feb. 14, 1921.

One place of our inspection work does not seem to have been clearly authorized by any instructions thus far, that is inspection in the messenger cars of trains which are passing through a station. No attempt has been made to do inspection work of this kind except upon the solicitation of the mail clerks. Our inspectors have made it a practice to ask the messenger clerks if they had any nursery stock in their car. Sometimes these clerks in a spirit of cooperation have handed our inspector packages for examination or if the mail clerk was busy, invited our inspector to come into the car and look around. All of the officials have indicated that we ought to inspect this material if we were really serious in our intention, and wished to examine all shipments. The spirit of cooperation has been such that we could hardly refuse it even though our instructions have not specifically covered the case, neither have we had any instructions from the post office forbidding such inspection. Wherever there has been no offer of cooperation by the clerks in the messenger cars we have not boarded them for inspection. However we have received such general cooperation in this matter that in only a few cases are the messenger cars not inspected. Consequently thus far we have had no need for special authorization to cover this class of inspection.

After your request for a special report regarding this matter I asked each inspector to report on the amount of such inspection at his post, and what suggestions he had to offer. I am concluding this report with a copy of the report of each inspector so that you can have their ideas regarding this phase of the work.

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As the inspection verther developed came inspection work in mail cars has been done. This verthhas been of two types: First, inspection in mail cars that their littial point or at their destiration and were have loaded or unloaded, second, inspection in messenger cars which were passing through an inspection point.

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Entering Mail Trains for Inspection Purposes, Spokane, Wash.

The mail cars of the following trains are actually boarded for inspection purposes:

	G.N. 39	0.W. 12	0.W. 77	N.P. 3
	N.P. 42	0.7. 85	C.M. 18	G.N. 2
	G.N.256	C.M. 15	N.P.311	N.P. 4
24	N.P. 1	N.P.314	G.N. 27	C.M.16
	0.W. 11	N.P. 2		

The amount of parcel post material made available for inspection in this way is approximately 50% of the total inspected at trains, but is only a small percentage (Probably less than 5%) of the grand total; for the great majority of shipments inspected are found in the Railway Mail Terminal and the City Post Office.

It is necessary to make these inspections aboard trains in order to inspect shipments orginating from and consigned to points where there is no inspector. It also greatly facilitates the inspection of trains that are made up here or whose run terminates at this point.

It seems impracticable to me to make train inspections without boarding the mail cars, because the mail clerks will often
invite the inspector to "come in and look around", and if he refuses
they (the mail clerks) feel that her is not sufficiently interested
in the performance of his duty and this will tend to destroy their
cooperative spirit.

There are two evident alternatives: (1) to obtain best results, the inspectors should have the authority to board mail cars for the inspection of loose nursery stock in transit. (2) A fairly good degree of efficiency could be obtained by omitting the train inspections and emphasizing regular inspections at the depot mail and express rooms at such intervals as the train schedules require. This second method would take care of everything except such shipments as are both from and to points served by the same train and at neither of which an inspector is stationed.

Entering Mail Trains for Inspection Purposes, Seattle, Wash.

The following trains are the ones on which I enter mail cars:

No Po # 333 Go No # 3 No Po # 1 No Po # 3 No Po # 41

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Agering Mail Trains for Inspection Turooses, Spokene, Sah.

The mail cars of the following trains are actually boarded for inspection purposes:

H.P. 3	77 .1:0	SI WWO	G.L. 39
S.W.D	0.1.13	0.1.85	S.b . 2. 1.
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		S . W	O. T. 11

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Entering Tail Trains for Inspection Purposes, Seattle, Cash.

The following trains are the ones on which I enter mail cars:

G	**	# 1 m	19 T	252		8 1.	·M
77	13_	4 L	* 1	3	11	* T	•W
				42	÷.	. T	3 1

I have had invitations to enter all of these trains. Recently G.N. #357 has carried many bundles of Christmas trees, and I have been invited, by the clerk, to enter the mail car and look over the shipments.

Nothing remains in mail or express cars and goes through to other points beyond Seattle, because the cars are completely unloaded here. The only reason why I have appreciated the chance to enter mail cars, was because I could make a quick survey of the nursery stock being carried, and did not have to wait while the train was being unloaded. The trains carrying the most nursery stock arrived early in the morning and in ten minute intervals. Due to the shortage of track space the trains are moved away before they are emptied of their mail and express. The mail and express cars are then moved to the milk shed which is far enough away from the depot to make it very inconvenient for the inspector to watch the final unloading of them and at the same time keep watch on the other incoming trains.

I can easily see how it would make the work much more efficient, if an inspector who is stationed at a point where the cars are not completely unloaded, could enter mail cars and examine plant material which is to be unloaded between his station and the next inspection point.

I have noticed that the mail clerks usually keep the nursery stock out from under the piles of mail sacks, and that, if the inspectors had authority or permission to enter the mail cars, they could, after acquainting themselves with the systems employed by the clerks in sorting quickly examine the shipments which would be missed otherwise. I found that I could do this without being in the way at all.

Note: I have learned since writing to you before that no trains carry any kind of mail or express beyond Seattle without its having been unloaded here.

Entering Mail Cars for Inspection Purposes, Pasco, Wash.

				N	orthe	rn Pacif:	ic M	air	n Line		
	Train	:	Dire	ection	:	Time		:	From	:	To
No	42	:	East	Bound	:	2:20A.	M.	:	Seattle	:	Kansas City
11	4	:	11	12	:	3:20 "		:	**	:	Chicago
12	334	:	11	tt	:	11:05 "		:	12	:	Spokane
17	3	:	West	11	:	11:20 "		:	Chicago	:	Seattle
11	: 2		East	11	:	5:40P.	M.		Seattle	:	Chicago
12	353	:	West	11	:	6:45 "		:	Spokane	:	Seattle
12	1		11	11	:	9:20 "		:	Chicago	:	99
12	41	:	11	11	:	10:55 "		:	Kansas City	:	tt

I have the invitations to inter this change trains. Teconting the same trees, and its or the invited, by the close, to enter the nail car and look order to this here.

Loting remains in their or express ders and ross through to other points beyond reason why I have appreciated the chance unloaded here. The only reason why I have appreciated the chance to enter mail cars, was because a could make a quick rarvey of the nurseau stock being carried, and did not have to wait while the train we seing unloaded. The twins carrying the most requery stock arrived erly in the norming and in ten mirate intervals. The to the short, a of tract appear the trains are coved away before the rare emptied of their and express. The land erross cars are then moved to the mile and express. The land erross cars are then moved to the mile shed which is far enough way from the depot to make it very inconvenient for the inspector to watch the final unloading of them of the other and the contractions are their them.

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I have noticed that the mail elegts usuall toon the nursury stock out from under the piles of mail secks, and what, if the inspectors but such orthority or permission to outer the rail care, the could, after account time denseives with the systems employed by the element in section of ield, examine the animents the tenth of the unissed other in tenth that I could do this titlest being in the our at all.

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	Train	2	Direction :	Time	:	From		То
No.	347	:	:	4:00A.M.	:	Pasco	:	Walla Walla
11	352	:	:	10:40 "	:	Walla Walla	:	Pasco
11	349	:	:	11:40 "	:	Pasco	:	Pendleton
11	351	:	* `	11:50 "	:	Pasco	:	Walla Walla
77	350	:	:	5:30P.M.	:	Pendleton	:	Pasco
11	348	:	:	10:00 "	:	Walla Walla		Pasco

			S	okane.	Portland & Sea	ttle Railway		
No.	3	- :	West	Bound	: 12:10A.M.:	Spokane	:	Portland
11	2	:	East	11	: 2:20 " :	Portland	:	Spokane
11	1	:	West	92	12:05P.M. :	Spokane	:	Portland
11	4	:	East	ff	: 4:20 " :	Portland	:	Spokane

Ot	ther Inspection	n Points
Place	:	Time
Post Office	:	5:55 P.M.
Freight Office	:	10:15 A.M.
11 11		8:50 P.M.

	Mail Cars which	I enter	
N. P. #4.	at 3:20 A.M.	N. P. #3	at 11:20 A.M.
N. P. 2	at 5:30 P. M.	N. P. 1	at 9:20 P.M.
N. P. 347	at 4:00 A.M.	N. P. 348	at 10:00 P.M.
S.P.S. 3	at 12:10 A.M.	S.P.S. 2	at 2:20 A.M.
S.P.S. 1	at 12:05 P.M.	S.P.S. 4	at 4:20 P.M.

Most of the mail clerks on the above trains have what loose parcels they have ready to hand out to me when they come in so that I can look at them while they unload the pouches. I always go into the blind end of these cars. Approximately three-fourths of the parcel post inspected here is done thru this method.

If we are not allowed to inspect parcel post in mail cars we might as well quit. For instance a person living at Centralia, or any place along the line where there is no inspector, could send a package of contraband plants to some place in idaho, Hope, Idaho, for instance, and we would never know about it unless we are allowed to enter mail cars. Or a package could be placed on N. P. No. 1 at some point in illinois and come clear out here to Kent, Wash. without ever being taken off the car.

I believe a letter from the Postmaster General authorizing as to entering mail cars or instructing mail clerks to hand the loose parcels apparently containing nursery stock out to us would solve it. Of course it would not be practical to hand out the parcels if there are very many of them, but when there are only a few this system works very well.

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Entering Mail Cars for Inspection Purposes, Tacoma, Wash.

As I interpret our instructions on Page 2 we have no right to enter mail cars. For this reason 1 have not done so. As mail robberies have been numerous at times and postal employees are armed I do not believe it to be a good plan, though 1 am perfectly willing to do so. The best method 1 know of is to ask the mail clerk on duty at the R. R. station to pass out any shipments there may be in the car for inspection. As I am acquainted with them they do it willingly while they are loading and unloading the mail car. However, as the only shipments 1 find in that way here are a few certified ones from Washington Nursery Co., to California points it is not a very important matter at Tacoma. I believe we can secure as good results without actually entering any mail cars under most circumstances.

Entering Mail Cars for Inspection Furposes, Pendleton, Ore.

Trains No. 78, 1, 141, 349, 17, 2, and 77. These are the trains in which I enter the mail cars. Trains No. 24 and 18, the mail cars are seldom entered.

.

By entering the mail cars, it enables me to inspect almost all of the shipments which remain on the cars and which otherwise could not be inspected here. Koughly guessing I would say that, about one-third as much nursery stock passes through here in the mail cars, as is taken off.

I believe the inspector should be granted authority to inspect loose nursery stock packages in the mail cars, for the following reasons:

A. If careful he would not in any way hinder the work of the men in charge of the car or cars.

B. He could inspect those packages that are taken off before the next inspection point is reached—thus cutting down the chances of a violation to pass uninspected. For instance; an incident that happened here last spring and related to me by the express agent (Mr. Kline) clearly shows why the authority in question should be granted. A shipment of white pine, via express, from a small town in Pennsylvania to Pomeroy, Wash., was caught by the inspector at this place. It was a federal violation and if the shipment had been by parcel post instead of express, the violation would not have been detected, as it would have been in the mail car and unloaded at a place where there was no inspector.

By not having authority in regard to entering mail cars, it is readily seen that shippers can easily avoid the quarantine laws regarding the shipment of kibes and five-needled pines, and in

Entering Tail Cars or Inspection Furnoses, Jacona, Jaso.

As I interpret our Instructions on Page 2 we have no right to enter meil cars. For this reason 1 have not done so. Is noil robberies have been numbered at times and postal employees are assed 1 do not believe it to be a good plan, though 1 am perfectly willing to do so. The best method 1 know of is to ask the mail clerk on dutt at the 14. It station to pass out any shipments there may be in the car for inspection. Is I am sequention with them they do it villingly while they are loading and unloading the noil car. However, as the only shipments 1 find in that way here are a few certified ones from important matter at Macous. I believe we can secure as good results important matter at Macous. I believe we can secure as good results without actually entering any mail cars under most circumstances.

Entering Tail Gars for Inspection survoses, Pendleton, Ore.

Trains No. 78, 1, 141, 549, 17, 2, and 77. These are the trains in which I enter the mail cars. Trains No. 24 and 18, the mail cars are seldom entered.

By entering the mail cars, it enables me to inspect almost all of the shipments which remain on the cars and unich otherwise could not be inspected here. Noughly questing 1 would say that, about one-third as much nursery stock passes through here in the mail cars, as is taken off.

I believe the inspector should be grated authority to inspect loose mursery stood produges in the mail cars, for the following resons:

A. If cereful he would not in any way hinder the work of the men in charge of the car or cars.

B. He could inspect those packages that are trien off before the next inspection point is reached—thus cutting down the chances of a violation to pass uninspected. For instance; an incident that happened here last spring and related to me by the express agent (Mr. Mline) clearly shows why the anthority in question should be granted. A shimment of white pine, it express, from a small town in Fennsylv his to Pomercy, Wash., was caught by the inspector at this place. It was a federal violation and if the shigment had been by parcel post instead of express, the violation would not have been detected, as it would have been in the mail car and unloaded at a place where there was no inspector.

By not having authority in regard to entering hall care, it is readily seen that shippers can easily avoid the quarantine laws regarding the shipment of mibes and five-needled pines, and in

this way keep inspection work below the standard which it could otherwise obtain. In my opinion the question is, "why have inspection work only about 60 or 70 percent efficient, when by granting the authority in question, the work could be made 100 percent efficient?"

The only solution I have to offer in regard to the situation is—that the postal authorities grant inspectors the right to enter cars, and inspect loose nursery stock packages. As stated before—that as long as the inspector in no way interferes (which is easily possible) with the work of the officials in charge, I see no reason why the authority would not be granted.

I know that by tactful cultivation of the friendship of the men in the mail cars, it is generally possible to enter the same, but it is certain that the same results can not be obtained in all cases, not as readily and easily as if the inspector would have the needed authority.

Entering Mail Cars for Inspection Furgoses, Fortland, Ore.

I enter the mail cars for inspection purposes on the following trains: U.P. No. 5, S.P.S. No. 3 and U.W.R.&N. No. 11. It is not absolutely necessary to enter these cars because of the fact that all mail is transferred in Portland. I enter the cars only to speed up the work and make sure that no shipments are missed while I am working another train. In case of the trains I have mentioned there are always one or more cars of mail besides the regular mail car. These are the cars I enter. I do not enter the regular mail car while the crew is working because the car is generally crowded.

The inspectors at points where all mail is not transferred from the trains (Points such as Pasco and Pendleton) should have authority to enter the mail cars for inspection purposes. In this way shipments that are dropped before another inspection point is reached, will be taken care of. If the inspector's are not allowed to enter the mail cars small parcel post shipments will sometime reach their destination without ever having been inspected by a quarantine inspector.

I would suggest that all mail clerks be asked to place loose parcel post shipments in such a place as to enable the inspector to find them readily on entering the car. I think, too, that most mail clerks would be very willing to cooperate in this manner. The nursery stock shipments could be placed on top of the different piles of mail sacks without inconveniencing the mail clerks in the least.

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this we keep inspection work below the standard which it could otherwise obtain. In my opinion the question is, "why have inspection work only about 50 or 70 percent efficient, when by greating the authority in question, the year could be made 100 percent efficient?"

The only solution thave to offer in released to the situation is—that the postal authorities grant inspectors the right to enter cars, and inspect loose nursery stock packages. As stated before—that as lone as the inspector in no we interferes (which is easily possible) with the work of the officials in charge, I see no reason why the authority would not be granted.

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Report on Quarantine Inspection Work Fall--1924

Inspection work during the fall of 1924 extended through the months of October, November and December, the exact period of inspection at each point being shown in the table showing the plant shipments inspected. Our inspectors were located at each of the following points: Portland and Pendleton, Oregon; Pasco, Seattle, Spokane and Tacoma, Washington.

The tables with this report give a summary of the inspection work done and the results of the work.

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1.3 Sanitation of Nurseries

Inspection and sanitation of nurseries has been conducted by the men engaged in cultivated black currant eradication, and has been largely covered in their reports. The most extensive work of this type is now being carried on in California. This state contains a large number of nurseries, many of which carry a large variety of stock. Excellent progress is being made in finding out if these nurseries contain cultivated black currants but this is a large piece of work and may not be completed for some time.

So far as is known, no nurseries in Montana, 1daho, Washington or Oregon now contain any cultivated black currants.

1.9 Public Information and Cooperation in Delaying Spread of the Rust

This subproject covers all cooperative educational and publicity work conducted with the cultivated black currant eradication program. Such work consisted of brief talks before various organizations, numerous newspaper stories, giving the local status of the work, and the use of the western blister film. The following report covers in more detail the use of this film.

USE OF THE WESTERN BLISTER RUST FILM

* * * * *

In May, 1924, 5 copies of the western blister rust film, "Blister Rust—A Menace to Western Timber" were received by the Spokane Branch, Office of Blister Rust Control. These films were immediately assigned to the blister rust leaders in the 5 western states in which blister rust work is being actively conducted by this office, namely, Montana, Idaho, Washington, Oregon and California.

At the time that these films were issued to the state leaders, the following memorandum was sent to them, concerning their use:

MEMORANDUM TO STATE LEADERS:

The Spokane office now has five copies of the blister rust motion picture film "Blister Rust—A Menace to Western Timber". It is planned to allot one of these films to the State Leader in each of the states of California, Oregon, Washington, Idaho and Montana.

As State Leader, it will be incumbent upon you to make proper arrangements to have this film shown, and to see to it that it is kept in good repair.

These films are issued to us upon the conditions that we arrange to keep them busy. Each of you can use your copy of the film

1.3 Sanitation of Murseries

Inspection and sanitation of nurseries has been conducted by the men engaged in cultivated black current eradication, and has been largely covered in their reports. The most entensive work of this type is now being carried on in valifornia. This state contains a large number of nurseries, many of which carry a large variety of stock. Excellent progress is being made in finding out if these nurseries contain cultivated black currents but this is a large piece of work and may not be completed for some time.

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MEMORARDUM TO SPACE LUADINS:

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As State Leader, it will be incumbent upon you to make proper arrangements to have this film shown, and to see to it that it is kept in good repair.

These films are issued to us upon the conditions that we arrange to keep them busy. Each of you can use your copy of the film

to good advantage in relation to your work. The following suggestions for its use probably do not cover all possibilities, but are merely indicative of what may be done:

- 1. Loan to Forestry Schools and Agricultural Colleges. All such institutions are anxious to show this film to their students.
- 2. Loan to secondary and grade schools. May be used to good advantage in relation to school campaigns or cultivated black currant work.
- 3. Loan to County Agents. Could be loaned upon request to county agents, through State Extension Leader. It is suggested that you discuss this matter quite fully with the State Extension Leader, making arrangements with him for the use of the film or any blister rust literature within his organization.
- 4. Show to scientific meetings, either special meetings, or at regular meetings of scientific organizations. For example, I recently showed this film to the Society of Associated Engineers, at Spokane, at one of their weekly noon-day meetings. The response was excellent.
- 5. Show at general public meetings, or at local theaters. Such use will be of special value in relation to your cultivated black currant eradication work. (See plan of work for cultivated black currant eradication as outlined at Spokane last December.) You will probably be able to have the film shown at local moving picture theaters in small towns where you are working. Please try this out. The use of the film will cost the theater manager nothing. He should be willing to include it in his program without any cost to us.
- 6. Loan to Forest Service officials.

I suggest that you immediately notify all organizations within your state that might be interested. Tell them you have this film and are willing to loan it to them. When a request comes in from an organization that you believe should show the film, send it to them by parcel post or express. The customary arrangement is for them to pay the return charges. Use your own discretion concerning this.

If you are making personal arrangements to show the film outside of the theater, you will have to secure the services of an operator with a portable projector. You will be able to find such an operator in most towns of fair size, by application to the local theater, film exchange, educational film bureau, high school, or store handling projecters and film supplies. Secure the cheapest rate possible from a competent operator. In Spokane I pay \$3 for an afternoon meeting and \$5 or \$6 for an evening meeting, the operator supplying the projector and making all arrangements for the supply and hanging of a screen. It has been my experience that the film exchanges

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to good advantage in relation to jour word. The following suggestions for its use probably do not cover all jossibilities, but are merely indicative of what may be done:

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will charge much more than the other suggested sources.

In case of such an arrangement, be sure that you are observing the local fire ordinances in regard to films. There are special rules to cover this in most towns. The operator can probably inform you. These films are of the relatively non-inflammable type, called "slow-burning". If ignited, they generally burn for a short distance and then go out.

You will also be given the responsibility of keeping the film in a good state of repair. After each showing, a film must be re-wound, The operator will practically always do this for you, if you request him to do so. Instructions with the film, however, state that it is not to be re-wound. So you will probably often have it returned to you not re-wound. I suggest that you make arrangements at your headquarters with some one who will re-wind and splice the film for you, at a nominal charge.

A film is occasionally broken while being shown. In such a case, the operator repairs it temporarily by fastening it together, generally with a paper clip. It will then have to be spliced before showing again.

By examination of the film you will note that each of the small pictures (called "frames") has 4 perforations opposite it, on each margin. In splicing, it is of great importance that the film be so out and joined together that the spliced frame will have 4 such perforations on its margins. If this is not done, the film will show "out of frame", when this point is reached. This means that the reproduction will have the appearance of being set either too high or too low on the screen, necessitating adjustment by the operator. In making arrangements for splicing, be sure to insist that the work is properly done, in this regard. Also, mention to the repairer that these films are of the slow-burning type, necessitating the use of a special cement.

For your information, I am enclosing a small printed circular, giving directions for splicing. The use of a splicing block is recommended, as it does better work than the hand method.

This office desires a complete record concerning the number of times these films are shown, places shown, and response. I am sending you a supply of forms which will give us the necessary information. Please fill out, or have filled out, one of these forms after each showing of the film, and send it immediately to the Spokane office.

Finally, I wish to again remind you of the necessity of making arrangements to secure full use of these films, They were secured for us because of our statement that they were urgently needed and would greatly assist us in our work. If you allow them to be unused for any considerable periods we shall not be justified in their purchase.

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Signed, Stephen N. Wyckoff

will charge much more than the other auggested sources.

In case of cuch an arrangement, be sure that you are observing the local fire ordinances in regund to films. There are special rules to cover this in root towns. The operator can probably inform you. These films are of the relatively non-in lammable type, called "slow-barning". If ignited, they generally burn for a short distance and then no cut.

Not will also be given the responsibility of keeping the film in a good state of repair. After each slowing, a film must be re-wound, The operator will practically always do this for you, if you request him to do so. Instructions with the rilm, however, state that is not to be re-wound. So you will probably often have it returned to you not re-wound. I suggest that you make arrangements at your hand parters with some one who will re-wind and splice the film for you, at a nominal charge.

A film is occasioned to broken while being shown. In such a case, the operator reprire it temponeril, by fastening it together, generall, with a paper clip. It will then have to be spliced before showing again.

By extmination of the film you will note that each of the small pictures (called "frames") has 4 perforations o posite it, on each margin. In splicing, it is of great importance that the film be so out and joined together that the spliced frame will have 4 such perforations on its margins. If this is not done, the film will show "out of frame", when this point is reached. This means that the reproduction will have the appearance of being set either too high or too low on the screen, necessitating adjustment by the operator. In making arrangements for splicing, be sure to insist that the vort those films are of the stow-burning type, necessitating the repairer that those films are of the stow-burning type, necessitating the use of a special cement.

For your information, I am enclosing a small printed circular, giving directions for splicing. The use of a splicing block is recommended, as it does better work than the hand method.

This office desires a complete record concerning the number of times these films are shown, places shown, and response. I am sending you a supply of terms which will give us the necessary information. Flease fill out, or have filled out, one of these forms after each showing of the film, and send it immediately to the Spokane office.

Finally, I wish to again remind you of the necessity of macing arrangements to secure full use of these films, They were secured for us because of our statement that they were urgently needed and would greatly assist us in our work. If you allow them to be unused for any consider ble periods we shall not be justified in their purchase.

-76- digned, btephen II. Wyckoff

Attached is a copy of the special form issued by this office to be used in reporting the use of the film.

Copies of the forms as sent to this office by the state leaders are appended to this report. A summary of these is given in the following tabulation:

TABLE NO. VII

	USE O	F BLISTER	RUST MOTION PICTURE	FIIM IN WEST	
	:Number:	Number:	Total	:Spectators Avera	ge
State	:Places:	Times:	spectators	: per	
	:Shown	Shown:		:Times S	hown
Montana	7	7	3370	481	
Idaho	: 11	12	1980	165	
Washington	a: 11	13	2532	195	
Oregon	6	12	1800	150	
California	2: 7	9 :	2650	294	
Total	: 41	53 :	12332	: 233	

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Note: the figures given for attendance at several of the Oregon showings are estimated, as no information was given by the state leader.

All state leaders have reported these films to be of great value, first in general educational work on blister rust, and second, in securing the eradication of cultivated black currants. This is particularly true in those states which have no legislation against the cultivated black currant, where the eradication of these plants must be secured through the consent and cooperation of the owner. As cultivated black currant eradication progresses farther from the white pine forests, the use of these films will be even more necessary than before. It is therefore recommended that these 5 films be continued in use on the present basis.

Stephen N. Wyckoff Associate Pathologist. Attached is a copy of the special form issued by this office to be used in reporting the use of the film.

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	481	*	0756	* 14	2 /2	: anatholi
	165	*	1980	: 12:	: 11	: odsbl
	195	**	2532	: 13 :	: 11	toongraides
	150	:	1800	: SI	; 3	: mogoro
	294	:	2650	: 0	: 7	: ciarofileD
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Stephen W. Myckoff Associate Pathologist.

PROJECTS 2 and 3

DEVELOPMENT AND APPLICATION OF LOCAL CONTROL

During the field season of 1924, the Western Branch of the Office of Blister Rust Control conducted an experimental local control project on the Kaniksu National Forest, Idaho. This project was larger in scope than those undertaken in 1922 at Elk River, Idaho and in 1923, at the Priest River Experiment Station, Idaho.

Purpose of Work

The purposes of this project were:

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- To continue the experimentation on methods of local control suitable to western forest conditions.
- 2. To so decrease the cost of local control that it can be economically applied to the white pine type of the Inland Empire forests. 1 1 to 1 1 1 3
 - To develop a personnel trained for such work, to be available in the future as this work increases in volume.
- Jt. To give actual protection to valuable white pine timber on a national forest, in a region directly threatened with invasion by blister rust.

Location of Work

The area finally chosen for this project was the Upper Priest River Velly, Kaniksu Mational Forest, Idaho. This area was chosen after due consideration had been given to several other possible areas, both by this Office and the officials of the Forest Service.

During the field season of 1923, preliminary and experimental reconngissance had been conducted on 4 areas in the Kaniksu National Forest by this Office, and one area in the Pend Oreille National Forest and one area on the St. Joe National Forest by this Office in cooperation with the Forest Service. These areas were known as the Upper Priest River Area, the Pend Oreille River Area, the Sullivan Lake Area, the Salmon River Area, the Porthill Area and the St. Joe Area respectively. Complete reports + concerning the work and conditions on these areas will be found in the Report of the Spokane Branch, Office of Blister Rust Control, February 1 to December 31, 1923, PP 293-325. - L. .

During the Spring of 1924, after the information on these areas had been completely assembled, a conference was held with the officials of the Forest Service, District One, Missoula Montana. The information concerning these areas was presented to them and

PROJECTS 2 and 3

DEVELOPMENT AND APPLICATION OF 100,1 CONTROL

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- 1. To continue the experimentation of methods of local control suitable to destern forest conditions.
 - 2. To so deems at the cost of low 1 control that it can be economically amplied to the white pind type of the Inlant Table forcats.
 - J. To Pavelon a nerronmal to ided for each work, to be gvailable in the frince as this work idem asse in volume.
- 4. To give ectual nectoction to relable white cime timber on a national forest, in a presion linearly threatened with inverion by blicker nuct.

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agreement was made that the Office of Blister Rust Control should, during the summer of 1924 conduct a local control project, with funds which this Office had available for such a purpose, in the Upper Priest River Area.

Description of Area

Upper Priest River Area is situated in the extreme northwest corner of the State of Idaho, extends southward from the International Boundary, and is but from 3 to 4 miles east of the Washington State line.

The valley is narrow and steep sided. The altitude of the stream drops from 3600 feet at the International Boundary to 2700 feet at the south edge of the area. The valley floor seldom exceeds \(\frac{1}{4} \) mile in width from which the valley sides rise steeply to altitudes of from \(\frac{100}{100} \) to 7500 feet. Several tributary streams of small size join the main valley, entering from the east. These occupy lateral valleys of good proportions, which are comparable in topography to the main valley.

The area covered by eradication averages about $l_3^{\frac{1}{2}}$ miles in width and is eight miles in length. It measures 7880 acres. The upper limits of the area range from 5000 to 5500 feet elevation.

Organization of Work

The actual work, as organized in the Upper Priest River Valley and adjacent territory consisted of five interconnected subprojects, all bearing on local control in its present experimental phase, but because of their experimental nature not all properly chargeable to the protection of the white pine on the area covered. These five subprojects are:

- l. Control Reconnaissance: a preliminary survey of an area being considered for protection, to determine need of protection, conditions affecting working methods, and basis for estimate of costs.
- 2. Ribes eradication: the actual protection of the white pine timber, by removal of the Ribes.
- 3. Study of methods: a purely experimental subproject for the development of better and cheaper methods of Ribes eradication.
- 4. Ecological study: an experimental study to determine conditions of Ribes and white pine growth in the white pine types, to establish indices of practical value in Ribes eradication.
- 5. Experimental chemical eradication of Ribes: an experimental study to determine the feasibility and cost of Ribes eradication by the application of toxic chemicals.

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The area covered by eradication averages about 14 miles in width and is eight miles in length. It measures 7880 acres. The upper limits of the area range from 5000 to 5500 feet elevation.

Organization of Work

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and D. 1, 2, of the estimates in the ten-year program, fiscal year 1925. In the general financial report they are considered separately. Because of their practical inter-relation, as part of the general western experimental local control problem, they are here discussed together. The personnel employed upon these five subprojects consisted of the following: La Control Reconnaissance * 1 Field Supervisor \$225 per month. 7 Recorders # \$80-\$125 " " the side of the 7- Helpers and the terms and have the \$ 70 " " (Note: 3 of the above helpers paid by the State of Idaho, for work on State Land) while a series of the fact of the Year THE REPORT OF THE STANLEY FOR STREET AND THE PROPERTY OF 2. Ribes eradication on the control of the desired of male and the state of the st 1 Field Supervisor 500, 100 \$225 per month Comp Bosses (Scouts) - frame \$125 " 125 " 1 \$80-\$110 1 \$80-\$110 7 Foremen 3. 35 Laborers: englis stouts with \$70-\$ 75 " 5 " 1700 h 1 4 g 2 Cooks ... \$1300 al piour 7 ... \$85-\$125 "" 1 to the legister of the party and to the section of Study of methods a. laField Supervisor 200 " \$200 " for the seas 1 Foremen's season to the season with the season to the sea \$ 70 I in the second of the second in the second in the second of the second without 4. Ecological Study a direction come omins sey at a way the material respect to the many the contribution of sistent to be seen of the seen want on Wart 2 Helpers & B to either ack to bit art 70 " 教皇室 "唯有一次一四年"等一次大学等点 5. Chemical Eradication A THE REST TO SELECTION . 22 BY STEEL CONTROL OF THE SELECTION OF THE SELE a way works of liField Assistantecton, its the the \$150 " " htm me hts the 1 Helper to be known the file work to \$ 70 " " STORY RESPONDED TO THE RESERVE OF TH 6. Supplies and Transportation

These five subprojects constitute projects B. 1, 2, 3,

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1 Warehouseman \$70-\$110 " "

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Personnel
The personnel employed upon these five subprojects consisted of the following:

1. Control Reconnaissance

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V3 V2	\$80-\$125		7 Recorders	
33 83	\$ 70		7 Helpers	
work	Idabo, for	by the State of	3 of the above helpers paid b	(Note:
			te Land)	on Stat

2. Ribes eredication

Mi mont	#G20'9G2D3#G GAG##			
	1 Field Supervisor 2 Camp Bosses (Scouts) 4 Scouts 7 Foremen 35 Laborers 2 Cooks Cooks Helpers	\$225 \$125 \$125 \$30~\$110 \$70~\$ 75 \$55-\$125	9 B	nonth n n n n
3.	Study of methods			
	1 Field Supervisor 1 Foreman 5 Laborers	\$200 \$110 \$ 70	89 81 83	11 11
.4	Ecological Study			
	1 Field Assistant 2 Helpers	\$150	12 71	83 33
5.	Obemical Eradication			
	l Field Assistant l Helper	\$150	8 f	88
68	Supplies and Transportation			

81	93	\$70-\$110	Warehouseman	1
81	21	\$ 70	Roustabout	1

The duties of the several classes of positions were briefly as follows:

h. 3)

- l. Field Supervisor: to apply all instructions received from the Spokane Office concerning the subproject of which he is in charge; to direct the work of all men on his subproject. He is responsible to the Spokane Office for carrying out the plans for his subproject, and to enable him to do so is empowered to alter details of these plans, subject to later approval by the Spokane Office, in order to meet changes in working conditions in the field, but not to change the objective of his subproject.
- 2. Camp Boss (Ribes eradication): he is responsible to his field supervisor for the completion of definite work as outlined by the field supervisor, and to carry out this work will plan the work of his crews and issue proper instructions to his scouts and foreman; to order such camp supplies as are carried in stock at the warehouse, in order to properly supply the commissary and general needs of his camp; to see that his camp is kept in proper sanitary and general cleanly condition, and to see that all general rules promulgated by the Spokane Office concerning sanitation, fire prevention, etc., are enforced; to keep all records of work performed by his camp in such shape that they will at all times be avail able to the field supervisors.
- 3. Scout (Ribes eradication): subject to general instructions from his camp boss, to outline and plainly mark the type boundaries as drawn up by the reconnaissance force; to direct the foremen to the boundaries of these types; and to conduct actual Ribes eradication on areas to be worked by scouts.
- 4. Foreman (Ribes eradication): acting under instructions from his camp boss, to direct the work of his crew in eradicating Ribes on the area assigned to him; to follow the method of work outlined to him by his camp boss, but during any day, while working without supervision; to use his discretion concerning any minor changes in working methods necessitated by varying conditions; to constantly check behind his crew, and by means of crew checks, his own checking work, and other ameans to keep the efficiency of his crew at the highest possible point.
- 5. Recorder(Reconnaissance): to carry out, with the assistance of his helper, such reconnaissance work as is assigned to him by his field supervisor; to keep his field notes and records in such shape that they will at all times be ready for inspection and for use by the Ribes eradication force.
- 6. Warehouseman (General): to assume entire responsibility for the safety and proper delivery at the several camps of all supplies and equipment, from the time that such material leaves Coolin, Idaho, until delivered to the camps; to keep on hand at the warehouse

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- 1. Field Supervisor: to apply all instructions received from the Spokene Office concerning the subproject of which he is in charge; to direct the work of all men on his subproject. He is responsible to the Snokene Office for derrying out the plans for his subproject, and to enable him to he so is emnowered to alter details of these plans, subject to later approval by the Snokene Office, in order to meet changes in working conditions in the field, but not to change the objective of his subproject.
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a proper stock of such supplies and equipment in order to fill all reasonable needs for the work; to fill all requisitions for standard supplies and equipment that are presented to him in proper form by any persons authorized to order such material; to keep complete records of all such transactions with the several field units, properly charging each unit with the material it has received.

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The above constitute the general instructions given to the men in the field by the Spokane office. It is also the duty of the Spokane office, to give all such general and specific supervision as is needed for the proper completion of the work; to issue instructions only to the field supervisors, field assistants, or warehousemen, such instructions to be given by these men to those working under them; to order and ship supplies as requisitioned by the warehouseman and to assume responsibility for their proper and immediate delivery to Coolin, Idaho.

B. Purchase and Transportation of Supplies.

Materials used during the field season on the several subprojects of local control consisted in general of the following classes:

1. Instruments: Abney levels, compasses, chains, diameter tapes and aneroid barometers.

Such instruments were either requisitioned from Washington, or were purchased locally, in cases justified by the lowest local price obtainable.

2. Camp equipment and general tools: tents, bedding, stoves, cooking utensils and dishes, Rives eradication tools, general camp tools and fire fighting equipment. Much of this equipment was purchased from the Forest Service, through their purchasing agent at Missoula. 500 single, wool, olive drab blankets were obtained from the War Department by payment of freight on their shipment from Fort Sill, Oklahoma. Ribes eradication tools were obtained from the Washington office.

3. Foodstuffs: all food and expendable camp supplies needed in the field. These were mostly obtained, by arrangement with the Forest Service, through their warehouse and central purchasing depot at Spokane. Small quantities of perishable foodstuffs, such as bread and meat, were purchased from local merchants at Priest River, Idaho.

The greatest bulk of material to be transported to the camps, consisting of the foodstuffs, came from Spokane. For the transportation of supplies and men from Spokane to the camps, the following contracts were made: Priest River Transportation Co., for transportation by

a proper stock of such supplies and equipment in order to fill all reasonable needs for the work; to fill all requisitions for standard supplies and equipment that are presented to him in proper form by any persons authorized to order such meterial; to keep complete records of all such transactions with the several field units, properly charging each unit with the material it has received.

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auto truck from Spokane to Coolin, Idaho, rate 1 cent per pound.
Distance 84 miles. For transportation by auto truck from Priest
river, Idaho, to Coolin, Idaho rate 3/4 cents per pound. Distance
26 miles. For transportation of men from Priest River to Coolin,
\$1.50 per man fro 10 or more in party. \$2.00 per man for less than
10.

S. T. Byars: for transportation of supplies from Coolin to the camps, rate 2 1/2 cents per pound. Distance 26 miles by boat, 11 to 14 miles by pack horse. For transportation of men from Coolin to the warehouse, rate \$1.50 per man, distance 26 miles by boat.

Methods of Work

A (2.12 and 3.12) Reconnaissance

Control reconnaissance consists of a preliminary study of an area under consideration for Ribes eradication to determine:

- 1. Location and extent of areas bearing sufficient white pine to justify protection, and age-class of the timber on these areas.
 - 2. Location and extent of eradication working types.
- 3. Factors influencing cost of eradication, such as abundance of Ribes, topography, brush, coniferous reproduction, windfall etc.

The value of control reconnaissance depends upon the scope and accuracy of the graphic and statistical picture of the area which is obtained from it, to be used as a basis for judgement as to whether the pine on the area justifies protection and for definite and detailed plans for the protection work. Since all western local control work has thus far been conducted on the basis of watershed units rather than land office subdivisions, it is necessary to include in such a picture the topographic features of the valley, the course and length of the main and all tributary streams, the location and extent of the different timber types and amount of timber and age-class, location and nature of any small areas representing particularly difficult working conditions, such as rock formations, windfall, etc., and location and extent of each eradication type.

During the course of the 1924 field season, 7 eradication types were recognized, defined, and the cheapest and most efficient method of Ribes eradication sought for each type. An eradication type consists of an area on which conditions are sufficiently uniform, and sufficiently differentiated from the conditions on contiguous areas, to be readily delimited and worked by a special method best adapted to those conditions. The types recognized were as follows:

anto truck from spokane to Coolin, idaho, rate 1 cent per pound. Distance 34 miles. For transportation by auto truck from Friest river, idaho, to Coolin, idaho rate 3/4 cents per porms. Distance 26 miles. For transportation of sen from Uniest liver to Coolin, (1.50 yer man fro 10 or more in party. (2.00 per man for less than 10.

o. 1. Syare: for transportation of supplies from Toolin to the cargs, rate 2 1/2 cents per pound. istance 26 miles by bout, 11 to 14 miles by pack horse. For trans ortation of men from Toolin to the warehouse, rate olaboran, distance 26 miles by bours.

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- 1. Location and extent of crees bearing radicient white pine to justify protection, and age-class of the timber on these areas.
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- 5. rectors influencing cost of redication, such as abraduce of sibos, tepography, brush, conferous retroduction, windfall etc.

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Definition of Types

- 1. Creek type: a strip, along a stream varying in width, representing an opening in the timber stands, and bearing growth of shrubby vegetation, consisting usually of Alnus, Salix, Acer, Rubus, and Ribes. Average Ribes per acre, 150 to 800.
- 2. Ribes free type: Areas of overmature, mature, or dense pole timber stands in which Ribes, together with other such shrubby vegetation have been mostly shaded out. Forest floor park-like in character, devoid of green vegetation, except in small isolated spots. Average Ribes per acre, 0 to 25.
- 3. Brush or reproduction uniforms: an area in which brush or reproduction have a fairly uniform but sparse distribution. Average Ribes per acre, 25 to 200.
- 4. Brush or reproduction patchy: an area in which brush or reproduction occur in dense patches, separated by clearings, or in which clearings occur in a general brush or reproduction cover. Average Ribes per acre, 25 to 100.
- 5. Thicket: an area which is uniformly covered with a very dense stand of coniferous reproduction, except where local irregularities in topography, rock outcrops, springs and seeps, etc., cause small brushy clearings, average Ribes per acre, 5 to 25.
- 6. Age burn (year burn): an area recently burned, in which there is as yet no coniferous reproduction above the seedling stage, but dense brush and many Ribes. Average Ribes per acres, 500. Age of burn to be determined and designated by reconnaissance crews.
- 7. Rock type: an area which is predominantly rock, either in the form of outcrop, slides, cliffs, or ledges. These rocky patches may occur in any timber age class causing openings where very little vegetation exists. Many Ribes are found, particularly at the base of rock formations. Average Ribes per acre, 50 to 250.

The actual methods of work evolved to give the requisit information are here given. All bearings were taken by compass, and all distances by pacing.

1. Primary or Base Reconnaissance

A-Traverses: the main streams in the drainage to be reconnaissanced were traversed and data taken as follows:

- 1. Direction of flow of main stream
- 2. Intersection and direction of flow of tributary streams.
- 3. Timber age class limits, and eradication type limits,

Definition of Types

- 1. Creek type: a strip, along a stragm varying in widte, representing an opening in the timber stands, and bearing growth of shrubby vegetation, consisting usually of Alnus, Salix, Acer, Rubus, and Ribes.

 Average Ribes per acre, 150 to 800.
- 2. Ribes free type: Arese of overmature, mature, or dense pole timber stands in which Ribes, together with other such shrubby vegetation have been mostly sheded out. Forest floor park-like in character, devoid of green vegetation, except in shall isolated spots. Average Ribes per acre, O to 25.
 - 5. Brush or reproduction uniforms: sn area in which brush or reproduction have a fairly uniform but apprage distribution. Average Ribes per acre, 25 to 200.
 - 4. Frash or reproduction patchy: sn area in which brush or reproduction occur in dense patches, separated by clearings, or in which clearings occur in a general brush or reproduction cover. Average Ribes per acre, 25 to 100.
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1. Primary or Base Reconnaissance

A-Traverses: the mein streams in the drainege to be reconneissanced were treversed and data taken as follows:

- 1. Direction of flow of main stream
- 2. Intersection and direction of flow of tributery streams,
 - 3. Timber age class limits, and eredication type limits.

- so far as could be seen from the traverse.
- 4. Location, elevation and direction of all vertical strips, situated so as to describe every timber age class. All data necessary to starting a strip was blazed on a tree on the strip near the stream. These vertical strips were placed 1/4 mile apart in mature timber, and not more than 1/2 mile apart on large burns.

The traverses were then plotted to scale.

B--Sketching

- 1. Topography. From a vantage point on each side of the valley, the topography of the opposite side was roughly sketched in on the previously prepared traverse.
- 2. Timber age class. From the same vantage point, the limits of uniform timber age classes were indicated on the map.

Wherever possible, this field sketching was done at a point on a vertical strip.

11. Secondary, or Detail Reconnaissance

A--Vertical strip

Strips at right angles to the main stream flow were run, the location of each having been determined as described above.

- 1. The accompanying form shows the data taken.
- 2. In addition to the above data, a column was added giving the eradication type.
- 5. The starting points of the horizontal strips were located on the vertical strips, so situated as to describe the area on each side of the vertical strip.

B-Horizontal strip

Strips at right angles to the vertical strips were run, located as described above. Regular reconnaissance data were taken, except that of timber data only timber age class was recorded. The following is the form used in taking reconnaissance data in the field.

so the traverse.

4. Docation, elevation and direction of all vertical strips, situated so as to describe every timber age class. All data necessary to starting a strip was blaned on a tree on the strip near the stream. These vertical strips were placed 1/4 mile apart in mature timber, and not more than 1/2 mile apart on large burns.

The traverses were then plotted to scale.

J--Size telling

- 1. Popography. From a vantage point on each side of the valley, the topography of the opposite side was roughly destroed in on the previously prepared traverse.
 - 2. Timber we class. From the same vantage point, the limits of uniform timber age classes were indicated on the map.

Therever possible, this field sketching was done at a point on a vertical strip.

11. Secondary, or Detail Reconnaissance

A---Verticol strip

Strips at right angles to the main stream flow were run, the location of each having been determined as described above.

- 1. The accompanying form shows the data taken.
- 2. In addition to the above data, a column was added giving the eradica-
 - 5. The starting points of the horizontal strips were located on the vertical strips, so situated as to describe the area on each side of the vertical strip.

3-Horizontal strip

Strips at right singles to the vertical strips were run, located as described above. Regular reconnsissance data were taken, except that of timber data only timber age class was recorded. The following is the form used in taking recommaissance data in the field.

CONTROL RECONNAISSANCE

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1 10 50 UP			
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CONTROL RECONNAISSANCE

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Cor	T. R. TOPOG						
, 192	BOCK						
Date	BRUSH DOMINANT SPECIES						

The data obtained from recommaissance was prepared in map form in the field, and then, as needed, these maps and the original data sheets were turned over to the Ribes eradication force for use in planning such work.

B (2.22 and 3.22 Ribes Eradication

The data received from the recommaissance force constituted the basis for the Ribes eradication. The field supervisor of this latter project first divided the area into proper working units for the two camps, and in conference with each camp foreman and the scouts, the area for each camp was further divided into blocks, or crew working units. The camp units were based upon accessibility to the most favorable camp sites, in order to reduce to a minimum the distance of walking to and from work. The blocks were coincident with eradication type boundaries wherever possible, but in many cases it was found necessary to have the blocks include more than one eradication type.

The records were then given to the scouts, for use in marking the actual boundaries on the ground. The two scouts assigned to each camp unit were responsible for having each eradication type, boundary, each block boundary, where these two did not coincide, and the upper working limit boundary plainly marked, for actually showing the several foremen these boundaries, and for the actual Ribes eradication in the Ribes free type.

With the exception of type 2, all the area was covered by eradication crews, each consisting of 5 laborers and a foreman. Each eradication type necessitated a modification of working method. Subject to minor changes because of slight variations in conditions the following methods were used on each of these types:

Type 1. Creek Type: crew works with an average interval of 6 feet, working parallel with stream, or across the contours. Stream used as starting line for first strip on each side.

Type 2. Ribes free Type: worked by scouts, usually in pairs, with an interval of 50 to 150 feet, depending upon age-class of timber. Scouts watch for patches of green vegetation caused by openings in the canopy, and which may contain Ribes.

Type 3. Brush or reproduction uniform: crew works with interval of 6 to 30 feet, according to density and character of cover, looking for Ribes, which are scattered promiscuously.

Type 4. Brush or reproduction patchy: crew works with interval of 20 to 50 feet, according to density and character of cover, looking for clearings, in which Ribes are apt to occur.

The data cataline from recommissing to present in the field, and the cripton in the field, and then, as needed, then regarded three to the to the five er dicarion force for noe in laming such order.

B (J.SS ond C.SS, Hims | Mulicetion

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The records sere that inch a the scente, for me in marine the actual boundaries on the provide the two accust action to each camp unit were respectable for lowing each block to be that the repeat state the two fill one coincide, and the appearanting limit benefits plain a race, for actual diversity of enveron force boundaries, we for the actual diverse conditation in the although the true.

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Igno 1. Greek land works with an average interval of freet, working narellel title street, or derous the contowns. Street used as startime for fire teach of each side.

Type 2. Ribes free thes norted by socres, usually in pains, will an interval of 50 to 150 free, asymming upon age-class of timber. Couts watch for metches of green vegetation caused by openings in one concertand which may contain lines.

Tree 5. Bruch or re-roduction uniform; erow vorus with interval of 6 to 50 feet, according to densit, and character of cover, locking for libes, what are restered provinceously.

Type 4. That or reproduction pitcher: crew veries with interval of 20 to 50 feet, according to density and character of cover, lessing for clearings, in which there ext to seem.

Type 5. Thicket: crew works with interval of 75 to 150 feet, according to density of cover, locating clearings where Ribes may occur. These clearings are carefully worked. Any large clearings are marked, and worked by scouts.

Type 6. Age burn: crew works with interval of 6 to 30 feet, depending on density of brush, which is dependent on age of burn. Careful search necessary to find Ribes, which are apt to be numerous.

Results of Work

A. Eradication

The field season was opened on June 16, when an advance party of men went to the Upper Priest River Area to prepare camps and move in supplies. On June 18, a party of men, consisting of reconnaissance recorders, crew foremen, scouts, and educational men went to the area for preliminary training. On July 1, men constituting the crewmen went to the area.

Of the entire field force of men permanently on the ground for Ribes eradication only seven had had any previous experience in this work. It was therefore necessary to put the entire force thru a period of training. This training period extended from June 20 (the date upon which the work actually started in the field) to July 12. The period June 20 to July was devoted to training the recorders, foremen, scouts and educational men; the period July 1 to July 12 represents the training of the crew men.

The work during the training period consisted of regular crew work, differing only from the later work in that a slower pace was used and the men were spaced 6 feet apart, even on ground where normally the spacing would have been greater. This close interval was used in order to permit the foreman to very carefully check the work of each man in his crew.

The work for the period July 13 to July 26 is considered as an experimental period. During this period the ground to be covered was intensively studied, and the eradication types given above were recognized and defined. Eradication crews were put to work, on an entirely experimental basis, on each eradication type, to tentatively determine the most efficient and cheapest method of working each type. This experimental work was generally organized as follows:

1. Spacing of men in crews

- a. Maximum interval compatible with efficient work in
 - (1) Mature timber stand with little ground cover
 - (2) Open stands with heavy ground cover.
 - (3) Dense reproduction with dead and down timber

Thre 5. Unidet: erev vorta in a community of the 150 feet, chur the to density of cover, locating there where where clearing are carefully content and correct by scoute.

Twoe 5. of brun: crew works litt interval of to .) feet, deponding on density of brush, which is dependent on to of brun. Marcial scared necessary to find hibes, which we apt to be massrous.

Results of intel

A. Brediosticu

The field reason was opened on June 15, when on Eavince part, of new went to the Typer vist River Area to prepare compactioned nove in such les. On June 16, a part of mer, consisting of reconneissance recorders, crew foremen, scouts, and educational men vent to the area for preliminary training. (m. Julu 1, men constituting the crewmen went to the area.

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a. Nurimum interval compatible with efficient manumin.

(1) Mature timber stand with little round cover

(2) Open studs with heavy round cover.

(3) Dense reproduction with dead and down timber

- 2. Method of eradication on slopes
 - a. Parallel with contours.
 - b. Up hill
 - c. Down hill.
- 3. Most efficient way of changing crew formation, where more than one eradication type occurred within a block.
- 4. Use of tools in eradicating Ribes.

The period July 27 to September has been considered as the actual work period. During this time, the best methods of Ribes eradication which had been evolved were put into operation on a sufficient scale to at least partially prove their value. The cost figures obtained during this period have been generally used as indicating the true cost at which this work can now be done by this office.

The following tabulation will give the cost, acreage and Ribes figures for these three periods of work:

Table VIII

General Results of Ribes Eradication

		Ribes Pulled	:Area :	Ribes:	Cost:	Cost	:	Total	
Period	R.	:R.visco-:	: Worked :	per:	per:	per	:	Cost	
	lacustr	e: sissimum: Total	: (Acres):	Acres:	Acre:	Ribes	:		
Training	8947	: 808 : 9755	: 511 :	19.1 :	8.61:	.451	:	\$4402.47	
Experimental	55071	: 2292 : 57363	: 1863 :	30.7:	3.02:	.10		5625.59	
Working	: 176611	: 83646 260257	: 5506 :	47.3:	1.63:	.034	3	8972.36	1
	:	:	: :	:	:		:		
Total :	240629	: 86746:327375	: 7880 :	41.5:	2.41:	.058	: ;	\$19000.42	

As Table 8 shows, both the cost per acre and the cost per Ribes pulled were materially decreased during the course of the season. A greater percentage of decrease, from the training period to the working period, is shown in the cost per Ribes pulled than in the cost per acre. This is due to the fact that most of the training period was spent on land with few Ribes per acre. As the interval between men in the crew formation was necessarily small during the training period, this combination of small interval and few Ribes is reflected in a heavy cost per Ribes pulled. This indicates a valuable lead in organizing such field work during future seasons. Due to a changing personnel, it will probably always be necessary to devote some time at the beginning of each season to the training of inexperienced men. The work during such a period should be done on land where Ribes are numerous and where working conditions would necessitate a narrow interval between even experienced crew men. Conditions usually

- 2. Tethod of eradication on aloyes
 - a. rarallel with contours.
 - Illing ou .d
 - c. Down hill.
- J. Most efficient war of changing over formation, here more than one eradication type occurred within a bluck.
 - 4. Use of tools in oradicating Mibes.

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Table Fill

General Results of Aibed Landlesticm

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0972.50		\$00.	2.60:	: 30 92	p.	5506	4	2 60257	33646	:	176611		Surring"
			2	:			9		9			*	
SA.0008	Ig. :	.058	:14.5	: 3.14	:	7380	•	527375	86746:		240629	:	fotul

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working period, is shown in the cost for dides fulled than in the cost
per nove. This is due to the fact that most of the training period was
spent on land with few Ribes per sore. As the interval between men in
the crew formation was mesescriff small varing the training period in a
this combination of small interval and fow dibos is reflected in a
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personnel, it will probably always be necessary to devote sone that
at the beginning of each season to the training of indeperhenced new
the work during such a period should be done on land where Ribes are
numerous and where wording conditions vould necessitate a number
interval between even or perionced crew men. Conditions results.

occurring in eradication Type 1 will prove suitable for training new men, as such land necessitates intensive working in any case.

Table 9, Given below shows a division of the area covered by Ribes eradication and the costs of this work on the basis of the eradication types described above. This work was done during the working period with the exception of the 12 acres of Type 6, a four year burn encountered during the experimental period. This is here included for comparison with the other types.

Table IX

Ribes Eradication by Eradication Types.

	: R. lac	ustre :I	?.viscos	issimu	m:Total:		: : :	* *
	: :	Percent:	:I	ercent	:Number:	Area	:Ribes:Cost:	Cost :
Type	:Number:	of :1	Number:	of	: of :	(Acres	: per : per:	per : Total
	:	Total:	:1	otal	: Ribes:		:Acre :Acre:	Ribes : Cost
	: :	Ribes :	:F	libes	: :			Pulled:
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Creek Type	: 46884:	96.4:	1742:	3.6	: 48626:	255.9	:190.0:6.60:	.035 :1689.18
2.	: :	:	:		: :		: : :	:
Ribes Free	: 25662:	68.0:	12091:	32.0	: 37753:2	2953.4	: 12.9: .79:	.061 :2320.77
Type	: :		:		:		: : :	:
3.	: :	:	:		: :		: : :	
Brush or Repro-	-: 95901:	60.3:	63224:	39.7	:159125:	1732.4	: 91.9:2.36:	.026 :4084.65
ductionUniform	:: :	:	:		:		: : :	:
40	: - :	:	:		:		: : :	:
Brush or Repro-		59.2::	3607:	40.8	: 8830:	254.0	: 34.8:1.57:	.045 : 400.88
duction patchy	:	:	:		:		: : :	*
5.	:	:	:		:		: : :	•
Thicket	: 2941:	49.6:	2982:	50.4	: 5923:	309.3	: 19.1:1.54:	.081 : 476.88
6.	:	:	:		:		: : :	1
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Total	:183648:	:	83646:		:267294:	5518.0	: 48.4:1.65:	.034 :9122.92

Table 9. shows that in general the cost per acre varies directly with the number of Ribes per acre, and that these two vary inversely with the cost per Ribes pulled. Because of the difficulty of working conditions, coupled with low Ribes per acre, Type 5 has a high cost per Ribes pulled, and a relatively low cost per acre. Type 1 shows a rather high cost per bush pulled in relation to the large number per acre. This is due to the fact that because of working conditions this type must all be covered in close crew formation, while the Ribes are generally in concentrations over relatively small parts of the area. Thus, considerable ground is often covered in close crew formation without pulling any Ribes.

Table 10 given below, gives the cost of subsistence, for the Ribes eradication, recommaissance, and ecological study crews, during the summer.

occurring is exadication lype 1 will prove saidable or training new men, as such land necessitates intensive during in any care.

Table 9, Given below shows a division of the area covered by Sibes eradication and the costs of this crit conthe btsis of the eradication types described above. This worst was done during the worsing period with the exception of the 12 acres of Type 6, a four year burn encountered during the experimental period. This is here included for conjertson with the other types.

Table ig Riber Tredication Types.

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Table 10 given below, gives the cost of subsistence, for the Ribes endication, reconnaissance, and ecological study crews, during the sumer.

Table X

Cost of Subsistence

b A

-4 · 4	: Wages : :Cost : Cooks :Cost of:Transportati : and : Food ::of : Helpers: :Food	:Cost ion:Handling : :at : :Warehouse:	Total Cost
Total for season	\$1388.73:4776.08:\$1840.62	\$ 351.82	\$8075.14
Number of days basis	4852 6553 6553	6553	
Cost per Man-day	\$.29: \$.7 3: \$.28	.\$.05	\$ 1. 35

The state of the s

In this table the number of days basis differs from the others in the case of wages of cooks and helpers, because of the fact that this item is only chargeable against Ribes eradication, the men employed upon the other sub-projects doing their own cooking. On this basis, the cost of subsistence per man-day for those sub-projects on which the men did their own cooking was \$1.06 per day, or .35 per meal. This cost permeal to feed the men in the Ribes eradication camps was .45.

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Cost of Subsistance

TotoT Cost	: Gost icu: Handling : : St :	st of:Transportati		
]8075 . 14	\$ 551.82	76.08: 21840.62	: 12388.77:47 :	Notal for season
	: 6555	2555 ; 5555 :		Tumber of days basis
\$ 1.35	: 30.	\$ •75: 3 •28	: :03.	Cost per Man-day

In this table the number of days basis differs from the others in the erse of rages of cooks and helper, because of the fact that this item is only chargeable against hibes eradication, the mon employed upon the other sub-projects doing their own cooking. (In this basis, the cost of subsistence per non-day for those sub-projects on which the men distheir own cooking was aloose sub-projects on which the men the the rest perrent to feed the men in the libes eradication camps was als.

B (2,22) Checking

During the course of the eradication work, special checks were made on 34 plots or strips, totalling 98 acres, or 1.24% of the area worked. This checking was entirely separate from that done by the eradication crews themselves who frequently checked back to determine and keep up their own efficiency. These special checks were of several different types, as follows:

- l. Plots of different sizes, laid off after the crews had covered the ground, laid out on different working blocks and on different eradication types.
- 2. Strips, run over ground previously worked by the crews; l or 2 rods in width and of varying length; on different working blocks and different eradication types; generally run at right angles to the eradication strips.
- 3. Advance plots, laid off and the ribes located in advance of the crews, the locations unknown to the crews, and checked afterward; size, 1 square chain.
- 4. Special crew checking. A crew of picked men, in regular crew formation, working a strip 50 feet wide,

In this checking work, 2 bases of efficiency were taken into account. On actual eradication work, the cost per acre could be greatly increased by a careful search for all Ribes seedlings a few inches in height. It is not yet known, if, under western conditions, this increased cost is justified by the increased efficiency. Checking records were kept on a double basis: (1) counting as misses only Ribes plants above the very small seedling stage, and (2) counting these seedlings as missed bushes. The difference in percent of efficiency between these 2 bases is 6.7.

Table 11, given below, shows the results of the checking done. The special crew checks are figured separately, as in this work the small seedlings were not searched for.

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:12	: 1.0	: 1.0		:33.0 :	: 33.0	: 85.1		101.1	: 72.1	84.2
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13:	: 2.0	2.0 :		1.0:	: 7.0	: 19.0	26.0	24.0	70.0	90.0
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This table shows an average efficiency of 83.2% when missed seedlings were counted as misses, and 88.9% when they were not. On the special crews checks, the average efficiency was 96.3%.

Plots 1 and 2 in table 11 represent the advance plot checks. Table 12 gives the results of these 2 plots by feet of live stem, as well as by number of bushes by live stem classes.

These plots, while too limited in number to give conclusive evidence, tend to corroborate the evidence in table 11 that most of the Ribes missed are very small bushes. On Plot 1, the efficiency by number of bushes is 87.1%; by feet of live stem it is 94.3% Further no bushes were missed having more than 6 feet of live stem.

Table 13, represents the results of a special checking study in relation to the efficiency of men who had been on forest fire. Four 2-acre plots were checked, on each plot containing 2 subplots of 1 acre each, the subplots in each case representing the work of the same crew before and after a week of fire-fighting. The plots were chosen adjoining each other on as nearly comparable ground as the checker could select.

This table brings out two points: first, that the same men missed many more Ribes after a number of days of fire-fighting than they did before, and secondly that the highest percentage of misses were in the classes having one foot or more of live stem. In other words after a fire they missed a higher percentage of the larger bushes.

From the summary of the check plots it is evident that as a result of fire fighting three times as many Ribes were missed compared with the number the same men would have missed if they had not had any fire fighting.

This table shows an overage efficiency of \$3.2% when missed seedlings were counted as misses, and \$8.0% when they were not. On the special crews checks, the special crews checks, the special crews of \$9.3%.

Plots 1 and 2 in table 11 represent the sivance plot checks. Table 12 gives the results of these 2 plots by feet of live stem, as well as by number of bushes by live stem classes.

These nlots, while too limited in number to give conclusive evidence, tend to corroborate the swidence in table 11 that most of the Ribes missed are very small bushes. On Plot 1, the efficiency by number of bushes is 87.1%; by feet of live stem it is 94.3% Further no bushes were missed having more than 6 feet of live stem.

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From the summary of the check plots it is evident that as a result of fire fighting three times as meny Ribes were missed compared with the number the same men would have missed if they had not had any fire fighting.

TABLE XII

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Note: Average Efficiency by Feet of Live Stem 97.3%
Plots checked before and after being worked by eradication crew. Crew did not know this work was being done.

Advance Plot Checks

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Mote: Average alliciency by Feet of Live Stom 672.7%

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TABLE XIII Before and After Fire Checks

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Perore and After Bire Checks

To determine if any special site conditions were particularly responsible for bushes being missed, a special study was made on the 362 bushes found by the checkers on 72 acres of ground. The following table gives the number and percentage of bushes missed on each of several typical site conditions.

TABLE XIV
Site Condition of Missed Bushes

; No. of Missed	: % of Total
: Ribes	:Missed Ribes
: 69	: 19.1
: 71	: 19,6
: 61	: 16.9
: 56,	: 15.5
: 29	: 8,0
: 25	: 7.0
: 21	: 5.7
: 15	: 4,1
: 7	: 1,9
: 3	: 0,8
: 2	: 0,6
3	: 0.8
: 362	: 100.0
	Ribes 69 71 61 56 29 25 21 15 7 3 3

C (312) Results of Control Reconnaissance on Federal Lands, 1924

The area covered by Federal reconnaissance crews lies entirely within the boundaries of the Kaiiksu National Forest in northern Idaho. It includes the drainage of the Upper Priest River and its tributaries from the point where reconnaissance work stopped in 1923 south to the north boundary of the Priest Lake Timber Protective Association. It also includes the drainage of Hughes Fork of Gold Creek south to and including the drainage of Quartz Creek. The map accompanying the office report shows the limits of this area.

While the area lies in one block, it was studied as three units as follows:

- 1. Upper Priest River, eradicated -- 7, 113 acres
- 2. Upper Priest River, not eradicated4, 128 acres

3. Hughes Fork and its tributaries.

not eradicated
Total acres

10, 865 scres 22, 106 To determine it eny special site conditions were particularly responsible for bushes being missed, a special study was made on the 362 bushes found by the checkers on 72 acres of ground. The following table gives the number and percentage of bushes missed on each of several typical site conditions.

TABLE MIV
Site Condition of Missed Bushes

% of Total		of Misse	OVI :	Site
19.1	duli, b. (g) Independent within the dutition of	69	6	Reised ground adjoining meture trees
19.6	*	71	;	Rock outerop association
16.9	*	61	*	Damp Slope and Alder bottoms
15.5	2 0	56	at At	Upturas
0.8	;	63	g v²	indfalls (on, under, or behind)
7.0	4	2 40 A	雄 昭	Dry drews
5.7	3 4	13	100 00	On decayed strangs and logs
I.H	ja b	1.5	*	Mulch of decayed branches
1.9	:	7	a 9	In dense brash
0.8	:	3	5 0	On creek banks
9*0	0 3	S	**	Covered by pulled Ribes
0.8	*	3	9	Miscelleneous
100,0	*	365	4	I GJOT

O (312) Results of Control Reconnaissance on Tederal Lands, 1924

The sree covered by Federal recompissance crews lies entirely within the boundaries of the Krinksu National Forest in northern Idaho. It includes the drainage of the Upper Priest Piver and its tributaries from the point where reconnaissance work stopped in 1923 south to the north boundary of the Priest Lake Timber Protective Association. It also includes the drainage of Hughes Fork of Gold Greek south to and including the drainage of Quartz Creek. The map accompanying the office report shows the limits of this area.

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- 1. Upper Priest River, eredicated -- 7, 113 acres
- 2. Upper Priest River, not eradicatedl, 128 acres
 - J. Rughes Fork and its tributeries,

not eradicated 10, 865 acres
Total acres 22, 106

Control Reconnaissance on this area was performed as explained above, by four crews of two men each, working under a Field Supervisor, who gave half his time to this project, and devoted the remainder of his time to similar work carried on on lands in the Priest Lake Timber Protective Association.

There follows a detailed description of the work done on each Unit Area:

I. Upper Priest River, Eradicated.

This area does not include the entire portion eradicated in 1924, but only that portion covered by reconnaissance in 1924, beginning where reconnaissance left off in 1923, approximately between Sections 14 and 23, T. 63 N., R. 5 W. The map shows the limits of this block. The area occupies all or part of the following Sections:

In T. 65 N--R. 5 W--Boise Meridian, Idaho Sect.--22, 23, 26, 27, 28, 33, 34, 35.

In T. 64 N--R. 5 W--Boise Meridian, Idaho Sect.--3, 4, 9, 10, 15, 16.

Table No. 15 shows the number of acres of each timber age class in each eradication type.

TABLE XV

Number of Acres of each Timber Age Class in each Eradication
Type in Upper Priest River Area, Eradicated.

	1,	Ang III Oh	her tire	So WIAGI.	Area, r	Taures. rec	
Timber :							: % of area
Age Class :		Eradic	: in each				
Years:		: :	:			:Total	Timber
	1	2 :	3:	4:	5	:Acres	: Age Class
20-110 :	152	:	839 :	*418:	415	: 1821	: 25,6
40-60	20	, part and	714	*282 :	37	: 1053	14.8
100-200	113	1320 :	769	59:	(mak-mak-mak	: 2261	31.8
200 + :	318 603	1.573 : 2893 :	2322	* 87 : 846 :	449	: 1978	27.8
% of area:		:	:	:		and the same	
in each : eradication type. :	8.5	40.7	32.6:	11.9	6.3	•	100.

*When this Upper Priest River area was reconnaissanced, the idea of eradication types had not been evolved, consequently the eradication crews determined the eradication types. When the eradication types were worked out from the reconnaissance notes there were certain discrepencies

Control Peconapiesence on this gree was performed as explained gbove, by four crews of two men each, vorking under a Field Supervisor, who gave helf his time to this project, and revoted the remainder of his time to vimilar work carried on on lands in the Priest Leke Timber Fratective Association.

There follows a detailed lengthfor of the work done on each Unit Area:

I. Upper Priest River, Brodicated.

This eres does not include the entire portion eradicated in 1921, but only that portion covered by reconnsistance is 1921, beginning where reconnsistance left off in 1923, approximately between Sections 14 and 23, T. 63 M., R. 5 M. The men shows the limits of this block. The area occusies all or part of the following Sections:

In T. 65 N-R. 5 --Boire Meridian, Ilaho sect.--22, 23, 26, 27, 28, 33, 34, 35.

In T. 64 N-R. 5 M-Edise Meridian, Idebo Scot. -3, 4, 9, 10, 15, 16.

Table No. 15 shows the number of seres of cach timber age class in each eradication type.

TARLE AV

Number of Acres of each Timber Age Class in each Eradication

: % of gree : in each)ajeoibatE	Timber :					
redeiT :	Total:	relig	1	*	* *	,	Years
: Age Class	: losi	- SIL	: 214*	839:	de constant ou company	152	CIL-OS
111.6	Egoi :	ho for	: 980*	: 417	B GCI Janu svog 5	09	63-04
38	1922 :	dilateral glassic standing	: 69 :	769	: OSEI	113	: 005-001
27.5	1978	214	: 648	: 3583	1577:	603 818	1000
.001	**	5.3	:6*11	* 3.95	: 10.7:	8.5	% of erez : in each : eradic; tion type. :

"Them this Upper Pricet River area was recommateranced, the idee of eredication types had not been evolved, connected that the anadication creme determined the eredic tion types. Then the eredication types were

1

as follows: o follows:

100 acres, 20-40 year age class, eradicated as Eradication Type 2, considered as Eradication Type 4 in this table.

141 acres, 40-60 year age class, eradicated as Eradication Type 2, considered as Eradication Type 4, in this table.

6 acres, 200 4 year age class, eradicated as Eradication Type 5, considered as Eradication Type 4 in this table

Table No. 16 shows the eradication factors per acre for the different eradication types in each timber age class.

as followest of the

100 cores, 20-40 year age class, et dicator or Ersdication Type 2, considered as Ersdication Type 4 in this table.

141 seres, 40-50 year age class, eradicated as Eradication Type P, considered as Fradication Type 4, in this table.

6 scres, 200 + venr age closs, aradicated as Bradication Type 5, considered as Bradication Type 4 in this table

Table No. 15 shows the credication factors per acre for the different eradication types in each timber , we closs.

White Pine and Ribes Conditions, by Timber Age Classes and Eradication Types, Upper Priest River Area Eradicated

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1 1

	•••	Win	ndi ns:	oil fal ity	ï	00	90 90	••	: 6: 61: M:	: 5: 4	: 4: 33: M: 7	: 3: 15: M: 7	: 4: 32: M: 7	••	: 4: 10: M: 9	. 3: 25:: 7	Ì.	9 : W:	; 3; 14; L; 8	00	8: 58: 8	: 2: 13: L:25		3: 40: M: 5	:2: 17: L:22	***	:4: 36: D:12	3: M:1	:3:65: M:6	:3:26: 12
	Acre: Grusn	● 31	Genera	•• ote		••	• • •	Andrew March	203: Sal-Aln-Rub-Acer	11n-	42:Aln-Pac-Sal-Rub	Pac	62: Aln-Sal-Pac-Rub	• •	500	10: Alm-Rub-Pac-Sal	Sal	- Community of Com	5:Aln-Sel-Rub	•	71:Aln-Sal-Acer-Pac	4:Pac-Vac-Tax	n-Men	142 : Pac-Acer-Tax	12 : Pac-Vac-Aln-Tax	••	73 :Tex-Ech-Sel-Aln	: Tax-Pac-Vac-Ech	120 : Tax-Vac-Ferns	13 : Tax-Pac-Tech
Types, Upper Fireso atver Ares at	Those Acre	: Repro-	Mature : Poles : duction : 70 : 70:	Mi Wh Pii Mi Wh	xe xe	e d e e	No		: 19: 50: 70:1072:	: 5: 25: 65: 80:321:2314:	.40: 22:140:173:204:1280: 20:	:11: 23: 55: 96:	4:105:331:	•••	Data : 16:-	25:113:293: 58:1881:Few :	28:137:261:205:2737: 1:F	4:190:120:5902::	10-12 :59: 26:142:265:129:2788: 1: 4:		:No: : Data	:45:137: 7: 76: 9 : 290: 4:Few:	:125: 9:231: 6:	- : 6: 55: 18:123:49 :2419: 142::	: 8:122:10 :	•••	:13:107: 17: 48: 4 : 384: 73::	: 7:113: 2: 87: 5 : 575:Rew ::	:: 6t ₁ 2:	20"-26" : 8:112: 4: 86: 4 : 550: 13::
D.F.O.	n E	rac	ass A	s cancere	of	res	uı:		20- :C-IM-H-S-WP-WF : I: 152: 46:	:WP-WI-H-C-S-DF : 3: 839:279:	40, :WP-C-IM-WF-H : 4: 418:190:	WP-H-G-WESDE : 5: 412:410:	:411:1821:925:	•••	40- : No data : 1: 20: 5:	WP-C-DF-H-WF	4: 282:110	: WP-H-C : 5: 37: 37:	AVE: WP-C-IP-E-WF : A11:1053:254: 10.	90	100-: No data : 1 : 113: 13:	: WP-C-H-WF-IM : 2 : 1320:503:	河	9-	-S-DF : All:2261:646:	}	: C-H-WP : 1 : 318: 43:	2004:0-H-MP : 2:1573:263:	:6 :28 : h :	AVF : C-H-WP : A11:1978:315: 20'

Explanation of abbreviations used in all tables.

Timber .

C-cedar; D.F. Douglas fir; H.-bemlock; S.-spruce; W.P.-white pine, W.F.-white fir; L.-lerch; L.P.-lodgepole pine.

Bush

Acer-Acer circinatum-vine maple

Aln -Alnus species-alduser

Cean-Ceanothus species-buck bush

Ech -- Echinopenex horridum -- Devils Club

Ep -- Epilobium angustifolium -- Fireweed

Lon -- Lonicera sp9. -- wild honeysuckle

Menz-Menziesia Ferruginea

Pac -- Pachistima myrsinites

Rhod-Rhododendron albiflorium

Rub -- Rub species -- thimbleberry, respherry

Sal -Salix species-willow

Tax -Taxus brevifolia-western yew

Vac → Vaccinium spg. --huckleberry

Windfall

H-Heavy windfall

M--Medium windfall

L--Light windfall

- Windfall practically absent

Ribes

R. viscoss. - Ribes viscossissimum

R. lac. -- Ribes lacustre

R, acer, P-Ribes acerifolium

The following observations may be pointed out from Table 16:

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and the strong of both parties with Table

- 1. In general, eradication type limits, and timber age class limits do not coincide. Eradication Types 1 and 4 accur in all four Timber Age Classes. Eradication Type 2 is confined to mature and over mature stands.
- 2. The largest volume of mature white pine is found in the 100 to 200 year age class where it makes up over 25% of the mature trees in the stand. White pine poles and reproduction are nearly negligible.
- 3. The overmature stand, which is confined exclusively to the level valley floor of the Upper Priest River, contains only approximately 7% by count of mature white pine. The stand is composed chiefly of over mature, badly rotted cedar and hemlock. There is considerable windfall

Explanation of abbrevi; tions used in all tables.

Timber

C-cedar; D.F. -- Douglas fir; H. --bemlock; S. --spruce; H.F. --white pine, W.F. -- white fir; L. --larch; L.P. --lodgepole pine.

USUE.

Acer-Acer circinatum-vine msple
Aln —Alnus species—buch bush
Cean-Genothus species—buch bush
Bob —Echisopensx horridum—Devils Club
Ep --Epilobium sniustifolium—Fireweed
Lon —Lonicers spin-wild honeysuckle
Menr-Menziesis Ferrugines
Fuc —Fechistims myrsinites
Find—Rhododeniron albiflorium
Fub —Rub species—thimbleberry, respberry
Salix species—willow
Fox —Fexus brevifolia—western yew

IIs that W

H—Heavy windfall

M—Wedirm windfall

L—Light windfall

windfall practically absent

Vac -- Vaccinium spg. -- huckleberry

Ribes

R. viscoss. --Ribes viscossinsimum
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- 3. The overmature stend, which is confined exclusively to the level volley floor of the Upper Priest River, contains only approximately 7% by count of meture white pine. The stand is composed chiefly of over mature, budly rotted ceder and banlock. There is considerable windfall

due to the presency of such over mature trees. There is an understory of cedar and hemlock poles, and scattering cedar, hemlock reproduction. White pine trees, below mature size, are practically absent.

- 4. In the 40-60 year age class, there is the largest number of mature white pine per acre. Over 69% of the trees over 8" D.P.H. are white pine. The average white pine is 10-12" D.B.H. In this age class there are 142 white pine poles, over 1/3 of the poles being white pine.
- 5. The 20-40 age class is essentially a pole-reproduction stand, with only 13 white pine per scre averaging 5" to 10" D.B.H.
 35% of the trees over 8" D. B. H. are white pine, and 42% of the poles are white pine.
- 6. The largest number of Ribes per acre is found in Eradication
 Type 1 in the 20-40 year age class. 98% of the Ribes here are Ribes lacustre.
- 7. Ribes viscossissimum is most numerous in the 20 to 40 year age class. It is practically negligable after the 40-60 year age class, probably being shaded out. Ribes lacustre is present in all age classes.
- 8. In general, it may be noted that the number of Ribes per acre varies directly as the density of the bush. This is particularly true in the 20-40 year age class.
- 9. It is also evident that Salix spp., Alnus spp., and Rubus spp., are the chief associates and indicators of Ribes, due probably to the fact that they indicate soil moisture.

Table 17 shows the Ribes conditions by eradication types irrespective of Timber Age Classes.

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and to the presence of such over meture trees. There is an understory of ceder and hemlock poles, and scattering ceder, hemlock reproduction. White pine trees, below mature size, are prectically absent.

- 4. In the 40-60 year are class, there is the largest number of mature white pine per scre. Over 69% of the trees of at I.3.H. are this pine. The average white sine is 10-12" D.B.H. In this age class there are 142 white pine poles, over 1/3 of the poles being white pine.
- 5. The 20-40 age class is essentially a male-reproduction stand, with only 13 white nine per care everaging 50 to 100 n.P.H. 55% of the trees over 80 D. R. H. are white pine, and 42 of the pales are white mine.
- 6. The largest number of Ribes per sore is found in Ergdication mype 1 in the 20-40 year age class. 93% of the Ribes here are Ribes lacustre.
 - 7. Ribes viscossignimum is most numerous in the 20 to 40 year age class. It is practically negligable after the 49-60 year age class, probably being shafed out. Ribes locustre is present in all age colasses.
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Table 17 shows the Pioes conditions by eradication types irrespective of Timber Age Classes.

TABLE XVII

Summary of Ribes Conditions by Eradication Types,
Upper Priest River Area, Eradicated

Eradi- cation Type	:	hains	R.	ibes per	:	Brush Genera	: :Ht.:	Den.	Visibility Windfall
_ 1 ,	: 603 :	107	:124	2	126:Sal-Tax	K-Aln-Ech-Rub	: 5:	47:	L:9
2	2893	766	: 3	Few _	: 3:Pac-Tal	x-Vac-Ech	2:	17:	L :21
3	:2322 :	508	: 16	49	: 65 :Aln-Ace	er-Sal-Vac-Rub	і ц :	36:	M : 8
Ĺ.	846	322	: 21	13	34:Aln-Sal	l-Pac-Tax-Rub	4	23:	M : 8
5	449	1447	: 4	20	24:Pac-Ali	n-Rub	· 3년 :	13:	M : 7
All	7113	2150	:15	: 18	33:				

An examination of the above table shows the following facts:

- 1. Eradication Type 1 has the largest number of Ribes per acre; followed in order by Type 3, Type 4, Type 5, Type 2.
- 2. The density of bush in the different Eradication Types follows the same order, with the exception of Type 2 in which the bush density is greater than in Type 5. This is probably due to the fact that the brush found on Eradication Type 2 areas is greater in tolerance than are the Ribes, hence the relatively few Ribes found.
- 3. Altho the brush is relatively absent in Type 5, the great amount of coniferous thicket reduces the visibility.

II. Upper Priest River, Not Eradicated

This area includes that portion of the Upper Priest River drainage lying south of the portion eradicated to the northern limits of the Priest Lake Timber Protective Association lands. The larger map shows the limits of this area.

This area occupies all or part of the following sections:

In T. 64 N-R, 5W, Boise Meridian, Idaho Sections 1-2-3-10-11-12-13-14-15.

1 .

In T. 64 N-R. 4W, Roise Meridian, Idaho Sections 7 and 8.

TABLE KVII

Summary of Ribes Conditions by Eradication Types,

	-	- 1900	THE R. P. LEWIS CO., LANSING MICHIGAN				811 550	1A 1:	27 V .1.23.	1301	1.7 12000		
	of of	1 4	2				ъ 4				a h	:	
	112 d	5	* * * * * * * * * * * * * * * * * * *	1000mg(t), m	gray-dung	Brush	: 970A	Tad	thes	A.	Chains:	1 .	Eradi-
	PITIC	front front hours	:.me(: : [etoT:				Studied:	Acres:	cation Type
i	2 :	. J	4711	*	3	Sal-Max-Alb-Mob-Rub	i ideal	Salar a gita magamini na	2 A	HSI:	107	: 503	
4	IS:	I	17:	2	S	Fac-Tax-Vac-Ech	2 A	we'	1 :	ξ :	756	: 2883:	S
1	2 :	M	:95		H :	Alm-Acer-Sal-Vac-Rub	: : 65 :	64	*	31	508	\$382	3
2	3 ;	M	:88:		<i>#</i> ;	Alm-Sal-Par-Tax-Rub:	34:	13	:	IS	322	: 846 :	41
,	•		~	* *	长	Fac-iln-Rub	48	GS	ž 8	ц	Lim	. ६ग्म	5
	-	AND THE TO	Late the confidences were one	1	dentages	Tradition delication of persons and production of traditions of traditions and traditions of traditions of traditions of traditions and traditions are traditional traditions and traditions and traditions are traditional traditions are traditional traditions and traditions are traditional traditional traditions are traditional traditional traditions are traditional traditional traditional traditional traditions are traditional		13	*	15	2150	: 7113 :	All

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- 3. Altho the brush is relatively absent in Type 5, the grant smount of coniferous thicket reduces the visibility.

II. Upner Priest Biver, Not Brailcated

This area includes that portion of the Upper Friet River drainage lying south of the portion ergdicated to the northern limits of the Friest Lake Timber Protective Association lands. The larger map slows the limits of this area.

This area occupies all or part of the following sections:

- In T. 64 M—H. 5W, Edise Waridian, Idaho Sections 1-2-3-10-11-12-13-14-15.
- In T. 64 N-R. 44, Boise Meridian, Isabo Sections 7 and 8.

Accessibility

A good horse trail runs thru this area from Upper Priest Lake along Upper Priest River. Camp sites established in 1924 large enough to accommdate four eradication crews are located where the trail crosses Rock Creek in Section 10, and at Lime Creek, Section 15.

There are several good camp sites along Lime Creek in Section 11 in the mature stand. No trail goes up Lime Creek, and the creek flows thru a narrow, steep-sided canyon in Sections 14 and 15, until it reaches Upper Priest River valley. Windfalls are numerous. The best possibility of reaching the upper portions of Lime Creek, would be by means of a trail constructed up the ridge on the north side of Lime Creek. It would be necessary to cut a trail thru one mile of 20-40 year timber with numerous windfalls, zigzagging on the slope, then reaching Lime Creek again in the mature timber. Probably the best method of working the head waters of the stream would be by means of fly camps, supplied by back packing.

There is a horse trail up Cedar Creek to Continental Mine. This trail would require some reconstruction work. Soft places are numerous. The grade is fairly good, altho steep in places. McLean Mine, Section 13, about two miles from Priest River Trail, is an excellent campsite. There is an abandoned cabin there with good cook-stove, fire-place, and spring. The site is on a level, cleared bench, affording good opportunities for pitching tents.

Approximately 12 miles northeast of McLean Mine is another good camp site along the trail on the North Fork of Cedar Creek in mature timber, near the northwest corner of Section 18.

Table 18 shows the number of acres of each timber age class in each eradication type.

TABLE XVIII

Timber Age	: Eradication	TypeAcres :% of Area in each
Class Years	:1:2:	3 : 4 :Total:Timber Age Class
10-20	4::	133: - : 137: 3.3
50-70	: 99 : :	536: 1128: 1763: 42.7
rio-90	: 12 : :	: 26: 38: .9
100-200	: 283 :1871 :	-: -: 2154: 52.2
500 7	: 8: 28:	-: -: 36: 19
Total	: 406 :1899 :	669: 1154: 4128:
% of acres in	1 1 1	: : :
each Erad.	:	
type	: 9.8: 4610:	16,2: 28,0: : 100.0

Accessibility

A good horse treil runs thru this area from Upper Priest Lake along Upper Priest River. Somp sites established to 1924 large enough to accommiste four eradication crews are located where the trail crosses Rock Greek in Section 10, and at like Creek, Jection 15.

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Approximately 13 miles northeast of McLean Mine is snother acod compatite slong the trail on the North Pork of Cedar Creek in maters timber, near the northwest corner of Section 18.

Table 15 shows the number of geres of each timber age class in each eredication type.

TITTA MISAT

of krea in each	6:	20104-		ication	5519	Tidor Age :
	a substantial contract or even	the time year the same .	an error maneta. V in an	and the same of th		Class Years :
3.2	137:	-	133:	3	: 15	10-20 :
7-54	763:	128: 1	536: 3	*	1 56	: 01-08
₽*	38:	:93	ş	*	: 3.1	: 0c:-04i
52.2	:471:	S :	-	1871:	: 223	: 003-001
ət	:6:	4	:	: 29	: 8	: 4 008
Auditor agrees is stated from the first time to the control of the	:281	154: 4	659: 1	1899:	: 304	: Sator
paragraph vigo 10 / 2 or a 1 miles plante on the Section Control of	;	2 4	4	1		ini serve in:
	*	2A B	+	*	*	each Ered. :
0.001	u 4	:0.88	1.6,2:	मिर्धाः:	9.8:	: eqnji

It may be noted that over half of the acreage is occupied by mature timber and that nearly half of the acreage is Ribes free. Prable 19 shows the eradication factors per acre for the different eradication types in each timber age class.

It may be noted that over holf of the sovetge in occupied by meture timber and that nearly half of the coreage is Riber free. Pricte 19 shows the eradication factors per sore for the different eradication types in each timber age class.

TABLE XIX

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White Fine and Eradication Factors by Timber Age Classes, and Eradication Types for Upper Priest River Area Not Eradicated

	Win	endfal	i i	: 2:20: M: 8	: 2:20: M: 8	8 :I :04:4 :	: 3:17: M: 6	: 4:30: E: 8		Control of the contro	3:18:1-:13	::3:18::13	:23:26::10	: 2:17::12	Ech-Tax: 2:19::12	• 11:35
s per :	Brush Genera	Total	scoss	38: 17: 55: Vac-Sal-Lon	.1	25:	18: 35:	1: 25: 26:	14: 28:	The specific of the specific o	: 3: 1: 4:S al-Pac-Rub	3: 1: 4:Se	: 70:: 70:Rub-Vac-Pac-Ech	3:: 3: Pac-Vac-Rub meh	: 18:: 18: Pac-Rub-Vac, Pac-	760.180180.89113
0011	Mature :Poles :Reprod.	White Mixe	ne No ed No ite ne No	: 3:25:: 49:458:2339	.25	42: 57:240:598	15: 33:	7:58:6	-	data ::::	10"-15" :37: 43:100:171: 33: 951	: 951	:16:104: 14: 84: 25: 583:		89: 40: 712	092 09 001 190
EIT		res	adiec	 :WP-DF-C-S-H : 3: 133: 86:	al:WP-DF-C-S-H :All:	20- :WP-C-WF-H : 1: 99: 36:	WF:	40. :WP-C-DF-H-L : 4:1128:393:	Total: WB-C-DF-H-WT:All:1763:708:			А11: 38: 46:	100-:C-H-WP-DF : 1: 283:183:	200. : WP-C-H-DF-WF: 2:1871:592:	Totsl:WP-C-H-DR-WF:All:2154:775:	

* On the areas covered by 10-20 year age class, and 40-60 year age class there is a small stream flowing through each. The reconnaissance strips did not hit either of these streams in the above mentioned age classes. Since there are undoubtedly Ribes along the streams, those portions were included in Type 1, eltho no data regarding the conditions are available.

:--:142: --: 51: --:1584: 40: --: 40: Ech-Sal-Tax-Ferns :--:154: --: 49: --:1820: --: --: Ech-Tax-Ferns

THE

36: 18: 2: 28: 14:

:A11:

2004 : C-H Total: C-H

: 2:13:--:12 :23:18:--:11

-106-

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An examination of Tables 18 and 19 shows the following facts:

- l. The largest amount of mature white pine per acre occurs in the 100-200 year, or mature age class. By count, white pine makes up 15% of the mature trees. The average white pine tree in the mature stand is approximately 20" D. B. H. and contains $5\frac{1}{2}$ sixteen foot logs.
- 2. In the 18 chains describing the 36 acres of 200 † year or overmature age class, no white pines were found. This overmature age class is confined to a narrow strip of level valley floor along the Upper Priest River. The land is occupied by overmature and rotting cedar and hemlock with seedlings underneath.
- 3. In the 40-60 year age class there are 37 white pine trees per acre 8" D. B. H. or over, or 46% of the meture stand. The average size of the white pine classed as mature is 10" D. B. H., with one log. In this situation, the 40-60 year age class is principally a pole stand. There are 100 white pine poles per acre, or 37% of the poles are white pine.
- 4. In the 20-40 and 10-20 year age classes, the seemingly large size mature white pines, are those of older age classes which survived the fires. The mature mixed in these age classes are principally Douglas fir trees which were not destroyed by fires.
- 5. The 20-40 year age class is essentially a pole stand. White pine makes up 44% of the poles.
- 6. The 10-20 year age class is essentially a reproduction stand in this area, containing 16% white pine.
- 7. In general, in each timber age class, the number of Ribes per acre varies directly with the density of bush. Eradication type 3, in 20-40 year age class is an exception to this rule.
- 8. The greatest number of Ribes viscossissimum per acre occurs in the 20-40 year age class. It is practically negligible in the older age classes, probably becoming shaded out.
- 9. The largest number of Ribes lacustre per acre is found along streams in each timber age class.

Table No. 20 shows the Ribes conditions by Eradication types irrespective of Timber Age Classes.

An examination of Tables 18 and 19 shows the following facts:

- 1. The largest smount of mature white gine per acre occurs in the 100-200 year, or mature age class. By count, white gine makes up 15% of the mature trees. The average white gine tree in the mature stand is approximately 20" D. B. H. and contains 5% sixteen foot logs.
- 2. In the 15 chains describing the 36 acres of 200 † year or overmeture see class, no white pines were found. This overmeture see class is confined to a narrow strip of level valley floor along the Upper Priest River. The land is occupied by overmeture and rotting ceier and hemlock was seedlings underneath.
 - 3. In the 40-60 year age class there are 37 white pine trees per acre 8" D. B. H. or over, or 46% of the meture stand. The sverage cize of the white pine classed as mature is 10" D. B. W., with one lag. In this situation, the 40-60 year age class is principally a pole stand. There are 100 white pine poles per acre, or 37% of the poles are write pine.
 - 4. In the 20-40 and 10-20 year age classes, the seemingly large size mature white pines, are those of older age classes which survived the fires. The mature mixed in those age classes are principally Douglas fir trees which were not destroyed by fires.
 - 5. The 20-40 year age class is essentially a pole stand. Thite pine makes up 44% of the poles.
 - 6. The 10-20 year see class is essentially a reproduction stend in this area, containing 16% white pine.
 - 7. In general, in each timber age class, the number of Riber per scre varies directly with the density of bush. Erndication type 3, in 20-40 year age class is an exception to this rule.
 - S. The greatest number of Ribes viscossissimum per acre occurs in the 20-40 year age class. It is practically negligible in the older age classes, probably becoming shaded out.
 - 9. The largest number of Hibes lacustre per sers is found along streams in each timber age class.

Table Mo. 20 shows the Ribes conditions by Ersdication types irrespective of Timber Ace Classes.

TABLE XX
Summary of Ribes conditions by Eradication Types, Upper Priest
River Area, Not Eradicated

	:	:- 00	Ribes	per.	Acre	: Brush	
Erad-	-:	:		4;	Н	•	न्त्राम् ए मार्ग्यन
icatio	-	: Chains:	Ę.		0	Benera	46, 6 D. Con
		:Studied:	20	isco	tol		is a picto
TATI	* WOLES	; pradied;			p-d	•	e e H
	,			co :		:	
	1	:		:		•	
	:	: :		1		:	: : :
1	: 406	: 223 :	81 :	1:	82	:Rub-Alm-Sal-Ech :	3:28:: 9
	:	: :				2	: : :
2	:1899	: 606 :	3	imano .	3	: Pac-Vac-Rub-Ech-Tax:	2.17.1. :12
-	9 110)					a serio velo italo inoli italia	1 m q dh ; q dd q 403m
•7	: ((0	7/5	0.7	77			7 3 6 14 6
3	: 669	: 500 :	25	31:	54	:Aln-Rub-Vac-Sal-Lon:	3:18:W : 8
	:	:	- 0			• •	• • •
61.4	:1154	: 439 :	2 :	22:	24	:Rub-Sal-Vac-Aln-Pac:	4:29:L:9
Total	:4128	: 16335 :	18	13:	21		: : :

Certain facts are evident from an examination of Tables 19 and 20.

- l. Eradication Type 1 (Stream Type) is present in all timber age classes.
- 2. Eradication Type 2 (Ribes free type) is confinded to mature and overmature stands.
- 3. Eradication Type 3 (Brush and reproduction uniform) and Eradication Type 4 (Brush and reproduction patchy) are chiefly confined to the 20-40 year age class.
- 4. Eradication Type 1 shows the greatest number of Ribes per acre, followed in order by Types 3, 4, and 2.
- 5. R. viscossissimum predominates Eradication Types 3, and 4; while the largest number of R. lacustre occurs in the stream type,

III Hughes Fork Area

and a sales from profit to perform the

Included in this unit are the drainages, Hughes Fork proper, Big Creek, and Quartz Creek. The map shows the location and limits of this area.

This area occupies all or part of the following sections:

In T. 64 N-R 5 W-Boise Meridian, Idaho Sections 5, 6, 7, 8, 9, 16, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32, 33

and the second of the second o

Summary of Ribes conditions by Eradicetion Types, Upper Priest River Area, Not Eradiceted

Testoff Land Control of the Control	Genera :	eroA	190 : A : 00 : 00 : 00 : 00 : 00 : 00 : 00	Ribes	: Cheing: Studied:	: 3	Ered-; icstin
3:28:: 9	: Rub-Alm-Sal-Mch	\$2 :	: : I	: 18	: ESS	: 304	<i>J</i> .
SI: JITI:S	: Pro-Vec-Rul-Teh-Tex:		÷	: : ξ	: 606	: 6651;	S
3:18:M:8	: Ala-Rub-Vro-Sel-Lon:	45	31:	: : {S	365	: 699	10° 4 1 ¹⁰⁰ - An
6 : T :62: 7	Rub-Sol-Vac-Aln-Pac:	to delinerate and the state	other determinations and	CONTRACTOR OF THE PARTY OF THE	18130 :	1511 1611	security of a security security

Certain facts are evident from an examination of Wables 19 and 20.

- 1. Eradication Type I (Stream Type) is present in all timber age classes.
- 2. Eradication Type 2 (Pibes free type) is confinded to unture and overnature stands.
 - 3. Predication Type 4 (Brush and reproduction patchy) are chiefly confined to the 20-40 vear are class.
 - 4. Ersdication Type 1 shows the greatest number of Ribes per ecre, followed in order by Types 3, 4, and 2.
 - 5. R. viscossissimum predominates, Bradication Types 3. and 4: while the largest number of R. lacustre occurs in the stream type.

III Hughes Fork Area

Included in this unit are the drainages, Hughes Fork proper, Big Creek, and quartz Creek. The map chows the location and limits of this area.

This area occupies all or part of the following sections:

In T. OH N-R 5 W-Boise Meridian, Isabo Sections 5, 6, 7, 8, 9, 16, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32, 32, 33

- In T-63 N-R 5 W-Boise Meridian, Idaho Sections 5 and 6
- In T-40 N-R 46 E-Willemette Meridian, Washington Sections 30 and 31
- In T-40 N-R 45 E-Willemette Meridian, Washington Section 36
- In T-39 N-8 46 E-Willamette Meridian, Washington Sections 6, 7, 18, 19, 30 and 31
- In T-39 N-R 45 E-Willamette Meridian, Washington Sections 1, 12, 13, 14, 23, 24, 25, 26, and 36

Accessibility

A good horse trail parallels Hughes Fork thru this area. It is kept up in good condition by the Forest Service.

An excellent site for a base camp for four crews is situated on the west side of Hughes Fork, near the N. W. corner of Section 17, T 64 N--R 5 W in the edge of overmature trees. This site was used by Reconnaissance Crews in 1924. Water facilities are good. There is little ground cover, wood is plentiful. This site is about 12 miles by trail from the head of the little lake.

For working the area north of this point, a possible fly camp might be located between the East and West branches of Hughes Fork. There is no trail to this point, and the going is hard due to bush and windfall. It would be necessary to construct a trail.

Below the base camp site to Big Creek, good camp sites are scarce. The water in Hughes Fork sinks in the ground during the summer from about the section line between 16 and 21, south to the south west corner of Section 21. Early in the season water is present and camping conditions are good at the junction of the Hughes Fork trail and trail to Priest River, in the north west quarter of Section 21.

At Hughes Meadow R. S., there are poor facilities for a large camp. The water available is in a dug out spring.

A good camp site for a base camp is on Quartz Creek near the main Hughes Fork trail in center of Section 32.

On Big Creek there is a good camp site in the south west corner of Section 20 between north and south forks of Big Creek. There is an old fire trail up to this point, which could be cleaned out and made into a horse trail. Suitable fly camp sites are found up each fork of Big Creek.

There are good camp sites up each fork of Quartz Creek.

- In 91-63 M-R 5 W-Boise Meridien, Idaho Sections 5 and 6
- In T-40 N-R 46 E-Willemette Moridico, assination Sections 30 and 31
- In T-40 M-R 45 H-Tillemette Meridian, westington Section 36
- In T-39 N-P 46 E-Millswette Meridian, Washington Sections 6, 7, 18, 19, 30 and 31
- In 1-39 W-R 45 5-%illomette Meridian, ashington Sections 1, 12, 13, 14, 27, 24, 25, 26, and 36

Accessibility

A good borse trail parallels Hughes Fork thru this area. It is kept up in good condition by the Forest Service.

An excellent site for a base camp for four crews is situated on the west side of Hughes Fork, near the N. W. corner of Section 17, T 64 N-R 5 N in the edge of overagture trees. This site was used by Reconnaissance Grews in 1924. Water facilities are good. There is little ground cover, wood is plentiful. This site is about 12 wiles by trail from the head of the little lake.

For working the arcs north of this point, a possible fly camp might be located between the Esst and West branches of Mughes Fork. There is no trail to this point, and the going is hard due to bush and windfall. It would be necessary to construct a trail.

Below the base camp site to Big Greek, good camp sites are scarce. The mater in Hughes Fork sinks in the ground during the summer from about the section line between 15 and 21, south to the south west corner of Section 21. Early in the season water is present and camping conditions are good at the junction of the Hughes Fork trail and trail to Priest River, in the north rest guarter of Section 21.

At Huthes Meadow R. S., there are poor facilities for a large camp. The water available is in a dug out spring.

A good camo site for a base camo in on Querta Creek near the main Hughes Fork trail in center of Section 32.

On Big Greek there is a good came site in the south west corner of Section 20 between north and south forks of Big Greek. There is an old fire trail up to this point, which could be cleaned out and made into a horse trail. Suitable fly came sites are found up each fork of Big Greek.

There are good camp sites up each fork of Quartz Ornell.

Table 21 shows the acreages of the different timber age classes and eradication types.

TABLE XXI

Number of Acres by Timber Age Classes and

Eradication Types in Hughes Fork Area

												6
Timber			Erad	icatio	n Typ	esA	cres			:% of	Acres	in
Age		:		*		:		: :		:each	Timbe	r
Class	0	1 :	2:	3:	4:	5:	6	: 7 :	Total	:Age	Class.	
0-10	:		ann				11	1	11		.1	
11-20	2	go:		**************************************		prox	3625	m-1 1	3705	: 3	4.1	
21-40	:	68:	:	1046:		257:		- :	1371	: 1	.2.6	
41-60		192:	tretung 0	1543:	1002-000 P			- :	1735	; 1	6.0	
61-80	:		1	200 AND -	(may-may 0	53:		- :	53	•	.5	
81-100	:	61:	:	-	289:	3		:	350	:	3.2	
101-200		289:	2654:	131:		;		: 43:	3117	: 2	8.7	
200+	4	92:	431:	combanes :	3-10 -00C B	0	part see	: :	523	9	4.8	
Total	:	782:	3085:	2720:	289:	310:	3636	: 43:	10865	:		een tige paydon
% of Acres in eac.	h:	1:	:	:	9	4		:		:		
Eradication Type	:	7.2:	28.4:	25.0:	2.7:	2,3	33.5	. 4:	}	: 10	0.0	
		and the same of th										7

An examination of Table 21 shows that over 1/3 of the area is occupied by a 10-20 year timber age class.

Table 22 shows the eradication factors per acre for the different eradication types in each timber age class.

Table 21 shows the acreages of the different timber age classes at eradication types.

TABLE ANI
Number of Acros by Timber Are Glasses and
Eradication Types in Hughes Fork Area

of Acres in		397.0883	cation Myroe	ibetE	W .	Timber
:each Timher	•		1 1	•	*	794
: her Class.	7 : Total	: 0 : 0	: 4: 5	: 9 :	1:	Olse e
		: ff : -		1 1	:	CI-O
		: 7502:		; :03		11-20
3.21 :	-: 1371	: : 773	: :9nci	: :80	3 :	CH-TZ
: 16.0	-: 1735	;	: : 5/61	: :30	: 19	09-Ti,
: .5	-: 53	: : : [d participant of minimum.	* * -		6380
3.2	-: 350	\$ \$:583:	: :[0	:	81-300
: 28.7	43: 3117	·	131::	:4692 :68	38 :	003-101
Married Andrews Control of the Contr	- martiners and assessment continuous and a	and a second control of the second control o	: :	members and the same and an electrical office	I down the same with the same	+00S
	43:10365	310:3636:	:035 :0378	FROT :SE	1	LafoT
ø 1	# 6	ф <u>А</u>	* * *	: ::	:40.00	e of Acres in c
C.CCI :		2.3: 33.5:	:1.8:0.38	:4.25 :5	-1 : 90	Er-fication "yo

go examination of Table 23 shows that over 1/3 of the sree is occurred by a 10-20 year thaber say clear.

Table 22 shows the eradication factors per sore for the different credication types to each timber are class.

TABLE XXII

Eradication Factors per Acre by Timber Age Classaa, and Eradication

Types for Hughes Fork Area.

	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		· · · · · · · · · · · · · · · · · · ·	Ribes par :	
Timber Stand	Chains of naissance Acr	M4mh.	er per Acre :		Towns with
					Brush : : 🔄
: Composition	adicati	Mature	: Polea : Raprod.:	は、 は Gendary	era : H · E · SI
Age :	ance Acres	W 1	निवास समान	• 4 4	e: p: p:
Class:	: E: 8:0 G-	W hite Pine:	Mixed White Pine White Pine Pine	L: 13: 21:	ibili /indra /ensit
:	to to the state of	ATA HELE	Elaci elaci el	D S D	windfall pensity Height
;	tri esc	in inches :No:	No.	· : 👸 : :	: हाला ी
1	10 Pi	::		: *: :	
0-10:WP-C-H	<u>: 6: 11: 1:</u>	()	:: 120: 80:	: 120:120: Vac-Sal-Eo	: 3:40:: 8
10- : C-H-DF-WP	: 1: 80: 5:	::	-: -: - : 8: No :	64:: 64:Aln-Sal-Ep	; 3:50; L:11
:		: :	: : : : Data:	1 1 1	
20. : WP-WF-C-H-LP-L	: 6:3625:687:	; <u>1</u> ;	1: 8: No :107: No::	7: 32: 39:Sal-Ep-Aln	: 3:30: E:15
_ : (30% W.P.)	1 1 1		: :Data: :Data:	1 1 1	. , , , , ,
Total: WP-WF-C-H-LP-L	: :3705:692:	18"-22" : 불:	1: 8: No :105: No :	7: 32: 39:Sal-Ep-A ln	3:30: H:15
		77 77		1. Jc. J. Bal Es R III	,), , , , , , , , ,
20- : WP-C-E	: 1: 68: 14:	:23:	14: 34: 90: 11:1347:	69: 6: 75:Aln-Sal-Rub	: 5:41:: 8
: WP-C-WF-S-H	3:1046:466:		12: 97: 89:144:1094:	7: 10: 17:Sal-Aln-Rub	
1 11 0 11 0 11	. ,,10,70,400.		12: 31: 63:144:1034:	f: 10: If:Sal-Ain-Rub	
40. :WF-C-H-WP-DFSS	: 5: 257: 99:		7. 00 7. 70 7.		2/3: : :
: NI-0-0-11-11-02	· 2: 421: 331	: 3:	7: 28: No : 32: No :	2: \$: 2a:Aln-Tax-Pec-	-Sal : 4:21: L:12
Total TO THE OF THE	7777 670	7011 7011 70	: :Data: :Data:		
Total: WP-WF-C-H-DFSS	: :1311:579:	10"-12" : 30: .	11; 81; 87;116;1081;	8: 8: 16:Sal-Aln-Rub	-Vec-Tex: 42: 34: L: 9
40- : C-WP-H	1 100 00				
	: 1: 192: 22:	:18: 4	18: 25: 153: 48:1138:	93: 4: 97:Aln-Sal-Rub	: 5:41:: 6
60. : WP-H-C-DF-WF-S		:24:	3 <u>6: 66: 181:106: 901:</u>	14: 12: 26: Aln-Sal-Pac-	-Vac : 5:37:: 9
Total: WP-C-E-DF-WF-S	: A11: 1735: 789:	12"-14" :24:	<u>37: 65: 180:103: 909:</u>	16: 12: 38: Aln-Sal-Pac-	-Rub-Vac: 5:38:: 9
60- : WP-H-DF-WF	: 5; 53; 106;		5:126: No : 36: No :	1: 2: 3: Vac-Tex-Lon	: 3:12:M :23
80. :	<u> </u>		: : Data: : Data:	: : :	
80- : C-H-S-WP	: 1: 61: 5:	!! 6	0: 40: 90:: 1050:	144:: 144: Ech-Vac	:23:56:: 4
100. :S-C-H-DF-WP-WF		:52:		38: -: 38:Aln-Vac-Lon	: 3:38:: 7
Total: S-C-H-DF-WF-WF	All: 350: 56:	16"-18" 5; 7		46:: 46:Aln-Ech-Vac-	Lon : 3:40:-: 7
100- :H-C	: 1: 289: 51:	: 4: 6	2:: 13: 4: 267:	48:: 48: Ech-Tax-Vac	:32:36::10
:B-C-WP-WF-S	: 2:2654:891:		1: 2: 70: 3: 272:		:23:18: L:18
200. :C-S-WF-WP	: 3: 131: 22:			13: 9: 22:Aln-Sal-Rub	:5½:43: L: 7
: WF-C-WF-H	: 7: 43: 14:			69: -: 69:Aln-Acer-Vac	
:					, , , , , , , , , , , ,
Total:H-C-WP-WF-S	: 3117:978:	20"-24" : 6: 7	: :Data: :Data: 70: 2: 123: 3: 393:	4: Few: 4: Tax-Vac-Alm	-Too-Fob. 7.20.
			0. 5. E.J. J. J951	T. P.CW. T. TAX-VAC-AIN	-Vac-Ech: 3:20: :18
200 +: H-C-WP	1: 92: 34:	: 10	18. E. 175. 20.1210	77 77 15. 5. 5	7 70 7
: C-H-WP	2: 431: 60:			77:: 77:A ln-Ech-Pac	
Total:C-H-SP	: 523: 94:	12" : 1:10	09:: 160: 5:1250:	4: -: 4: Tax-Aln-Pac	:35:18:1:11
2 3 5 2 4 7 11 11 2	1 7671 741	12" : 1:10	7: 7: 138: 10:1218:	30: -: 30: Tax-Aln-Ech-	Pac : 3:22:L:10

Note: On several of the reconnaissance strips no mixed pole and reproduction data were taken. These were omitted in the latter part of the season in order to gain time.

	*** ** ** ** ** ** ** ** ** ** ** ** **

-1-1-

An examination of Table 22 discloses the following facts:

- l. While mature white pine is found in every age class excepting the 0-10 year age class, there is not a large amount of white pine per acre ready to be cut.
- 2. The best stand of young white pine occurs in the 20-40 year age class. The average white pine over 8" D. B. H., here is a tree 11" D. B. H., 1½ sixteen foot logs high. Over 65% of the trees of 8" D. B. H. in this age class are white pine. Including the young mature and poles, it may be seen that 53% of the trees are white pines,
- 3. The mature white pine in the 10-20 year age class belongs to an older age class which survived the fire. There is also a very scattering overstory of larch.
- 4. From the small area studied in the 0-10 year age class, it is evident that white pine reproduction comes in readily in this location following a burn.
- 5. With the exception of the 100-200 year age class, ther number of Ribes per acre varied directly as the density of bush in each timber age class.
- 6. In general, the number of R. viscossissimum per acre decreased from 120 in the 0-10 year age class, to 2 in the 60-80 year age class. It may be noted that there were 9 R. viscossissimum per acre found in Type 3 in the 100-290 year age class. This portion of the mature stand is quite open, as evidenced by the high density of bush, 43%.
- 7. R. Lecustre is found in every timber age class, particularly along streams, and among rocks where there is seepage.

Table 23 shows the Ribes conditions by eradication types irrespective of timber age classes.

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un examination of Table 22 discloses the following facts:

- l. Thile meture white pine is found in every nee class excepting the O-10 year age class, there is not a large amount of white pine per acre ready to be out.
- 2. The hest stand of young mite sine occurs in the NO-VO year sge class. The average white pine over 8" D. R. H., here is a tree ll" i. R. H., l sixteen foot lors high. Over 66% of the trees of 8" D. B. H. in this are closs are white pine. Including the roung meture and poles, it may be seen that 53% of the tree are white pines.
 - 3. The mature white pine in the 10-20 year age class lelongs to an alder age class which survived the fire. There is also a very settering overstory of lerch.
 - 4. From the small grep studied in the O-10 year see class, it is evident that white oine reproduction cares in resdily in this location following a burn.
 - 5. With the exception of the 100-200 year are class, then number of Ribes per acre veried directly as the density of bush in each timber age class.
- 6. In general, the number of R. viscossissimum per acre decreased from 120 in the 0-10 year age of class. It may be noted that there were 9 R. Wiscossissimum per acre found in Mype 3 in the 100-200 year age class. This portion of the acture stand is outle open, as evidenced by the high density of bush, 43%.
 - 7. R. Lecustre is found in every timber age class, particularly slong streams, and among rocks where there is respace.

Teble 23 shows the Riber conditions by credication types irrespective of timber age classes.

TABLE XXIII
Summary of Ribes Conditions by Eradication Types, Hughes Fork Area

	: :	:	Ribe	s pe	r Acre	: Erus	h		= = <
Erad- ication Type		Chains: tudied:		R. visc.	: Total	Genera	:Ht.:Ft.	Den.	
1	782:	131	70	: 5	: 72	: Aln-Ech-Rub	: 31/2	: 37	: 8
2	3085	951:	1	!	1	Tax-Vac-Aln	: 3	18	L :17
3	2720	1255:	11	:11	: 22	: :A ln-Sal-Pac-Ru	b 5	37	ь:9
Ţŧ	289	51:	38		: 38	:Aln-Vac-Lon	: 3	. 38	≒- : 7
5	310	205:	2	: 1	3	· Vac-Aln-Tax-Pac	3	17	17
6	3636:	688	7	:33	140	:Sal-Ep-Aln	: 3	30	н :15
_7	43:	14:	69	\$ annun;	: 69	: Aln-Acer-Vac	4	: 40	9
Total	:10,865:	3295:	10	:11	: 21	•	1	:	

An examination of Tables 22 and 23 indicates the following facts:

- l, It is evident that timber type limits do not coincide with eradication type limits. The stream type, Eradication Type No. 1, occurs in every timber age class except the O-10 year and 60-80 age classes. Eradication Type No. 2 is confined to the mature and overmature stands. Eradication Type 3 is confined mostly to the 20-40 and 40-60 year stands, with a small percentage in the mature stand. Eradication Type 4 is confined to the 80-100 year age class. Type 5 is confined cheifly to the 20-40 year age class, with a small amount of the thicket type in the 80-100 year age class. Type 6 is confined to areas of recent burns, where the bush is the chief ground cover. Type 7 lies entirely in mature timber.
- 2. The largest number of Ribes per acre is found along streams in Eradication Type 1. The least number occur in mature and overmature stands.
- 3. R. lacustre is found principally along streams, and associated with rock formations where seepage occurs near the surface.

TABLE KKIII
Summary of Ribes Conditions by Eradication Types, Hughes Fork Area

di servicio del deligio como del deligio como del deligio como del deligio como deligio del deligio del deligio del deligio deligio del deligio deligio del deligio de	:		Eruch:	eroa r	७० इ	edia	Tableshi v Harr-edrica androveninnas ra	normalistical contract of the	pi religiormisadion montro giproji indire direktivi conservabilita i ili ili
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5	: 75		: Alr-Ech-Rud :	CT:	9:	70	:131:	: \$87	: [
71: 1	: : 81	: 5	Pex-Vec-11n		ar B same billion at a	Ţ.	:138	: = POF	: 5
E: 3	: 12	: 5	:A ln-Cel-Peo-Eud	SS :	11:	11	:5921	:0373	* \overline{\chi}
	: 88	: : ξ	: Lla-Vec-Lon :	38:		38	51:	: 688	. 1
The second	: 17:	: E	: :Vec-Alm-Tex-Pec:	: 3	: 1	S	: :70S	: :0.E.E.::	5
TI: H	: : 08	: [: :Sel-Ey-Aln :	O4(;	: :33	7	:883	: 3636:	9
Secretary as one of the secretary and the secretary as th	; Ch	: 4	: slx-Aner-Vac :	: 69	***	69	: til	: 54	Federal and response for a second
B B B B B B B B B B B B B B B B B B B	* *	* * * * * * * * * * * * * * * * * * * *	# B B B B B B B B B B B B B B B B B B B	: SI:	:11	OI	:2025	:10,865:	Total

An exemination of Tables 72 and 77 indicates the following facts:

- l. It is evident that timber type limits do not coincide with eredication type limits. The stream type, Eradication Type No. 1, occurs in every timber are class except the O-10 year and 50-30 age classes. Eredication Type No. 2 is confined to the mature and overmature stands. Eredication Type 3 is confined nostly to the 20-40 and 40-60 year stands, with a small percentage in the moture stand. Eredication Type 4 is confined to the 30-100 year age class. Type 5 is confined chaifly to the 20-40 year age class, with a small amount of the thicket type in the 80-100 year age class. Type 6 is confined to areas of recent burds, where the bush is the chief ground cover. Type 7 lies with a timber timber.
 - 2. The largest number of Hibes per acre is found clong streams in Eredication Type 1. The less number occur in mature and overnature stands.
 - 3. · R. lecustre is found principally plong streems, and sessociated with rock formations where sempere occurs near the curface.

- 4. A. viscossissimum is found most abundantly in the young age classes, where there is the least possibility of shading out by coniferous growth. The fact that there is such a large acreage of young reproduction stands supporting an average of 33 R. viscossissimum per acre, accounts for the fact that there was more R. viscossissimum than R. lacustre on the entire area.
- 5. In general, the greatest number of Ribes per acre occur where the density of brush is greatest.
- 6. The areas showing the largests number of Ribes per acre, also show Alnus sp. and Salix sp. as the predominant bush.

IV General Summary of Conditions on all Federal Lands Reconnaissanced.

Table 24 shows the number of acres of Federal land reconnaissanced in 1924, and the % of total in each timber age class and eradication type.

TAPLE XXIV

Number of Acres by Eradication Types and Timber Age Classes

on	all Federal Land Reco	nnaissanced	in 1924.	
	9		;Pe	ercent in
Timber	: Eradication Ty	pes in Acr	es :es	ach Timber
Age Class	: : : : :	:	; ; c.	lass.
(Years)	: 1 : 2:3 : 4 :	5:6:7	: Totel:	
0-10	5 1 1 1 1	: 11:	: 11:	
10-20	: 84 : : 133: :	:3625: -	: 3842:	17.4
20-40	: 319: :2421:1546:	669: : -	: 4955:	22.4
10-60	: 224: :2257: 308:	37: : -	: 2826:	12.8
60-80		53: : -	: 53:	. 22
80-100	: 61: : : 289:	entreprisoneres Tests a Testa e Marian e Marian e esta entre a para la comita de la comita del la comita del la comita della comita del	: 350:	1.6
100-200	: 685:5345: 900: 59:	: 4	3: 7532:	34,1
200 +	: 418:2032: : 87:	seed and a man and a seed	: 2537:	11.5
Total	:1791:7877:5711:2239:	759:3633: 4	3:22,106:	
% in each			:	
Eradicatio			:	
Type	: 8.1:35.6:25.8:10.4:	3.4:16.4:	2: :::	100.0
Marie Marie Artis and an indian design and the second	and the simulation of the street and the spice and the spice and	and the comment was an arrange and a second	And the second second second second	

- l. It may be noticed in the above tabulation, that over 1/3 of the total acreage is in Ribes free, mature timber stand.
- 2. The next largest area in an eradication type occurs in Type 3, in the 20-40 timber age class.

- h, \$\Pi\$, viscossis.imum is found nost abundantly in the young age classes, where there is the least possibility of shading out by coniferous growth. The fact that there is such a large screage of young reproduction atends supporting an average of \$\frac{3}{3}\$ R. Viscospissions our scre, accounts for the fact that there was more R. Viscossissimum than R. lacustre on the entire ares.
 - 5. In general, the greatest number of Ribes per sore occur where the density of brush is greatest.
 - 6. The errer showing the largests number of Ribes per sere, also show Alnus er, and Salix sp. es the predominent bush.

IV General Summary of Conditions on all Federal Lands Perconnaissanced.

Table 24 shows the number of acres of Federal land reconnaissanced in 1924, and the % of total in cach timber age class and eradication type.

MARLE XXIV
Number of Acres by Archication Types and Timber Age Classes

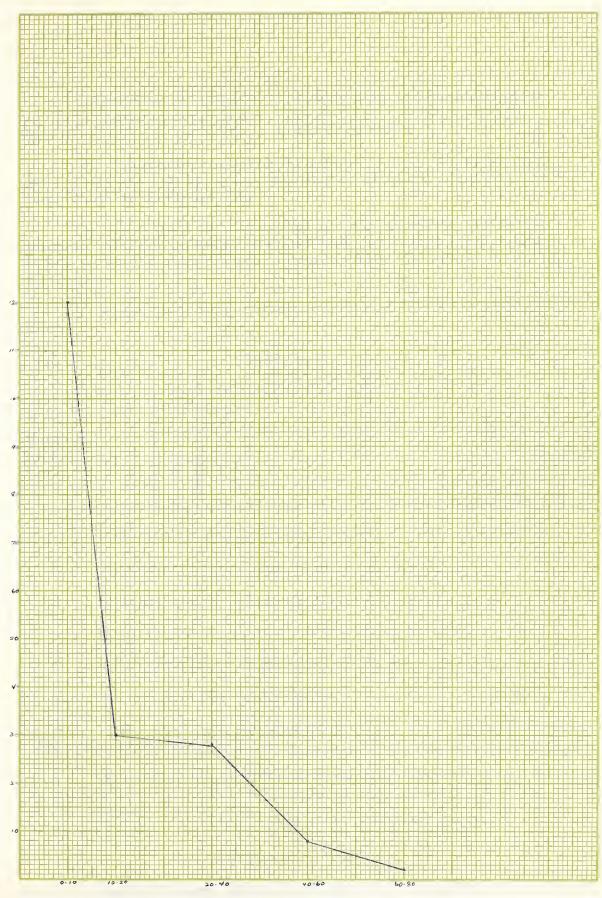
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55.	53:	; -		. 77	:	:	1 1	.: 08-09
A T	:005	: - :	2000 Atres.		:685	:	61: :	80-100
1.46	7538:	17.1			:08	:000	685:5845:	100-200
II.J	: 7533:	; ;			87:	y same	418:2032:	: + 003
	:601,39	13:	3633	759:	:6233:	5711:	791:7877:	Totol :1
	*				1	•	h y	in cech :
	å *	;	:	q v	:	4	: :	Eradic: tion
: 100.0	1 7 1 1		16.4	1.7	2 - 1 7 - 7	:5.5:	8.1:35.6:	Type :

1. It may be noticed in the above *abulation, that over 1/3 of the tatal screams in Ribes free, meture the ber stand.

2. The aski lergest gree in an eradication type occurs in Type 7, in the 20-40 timber age class.

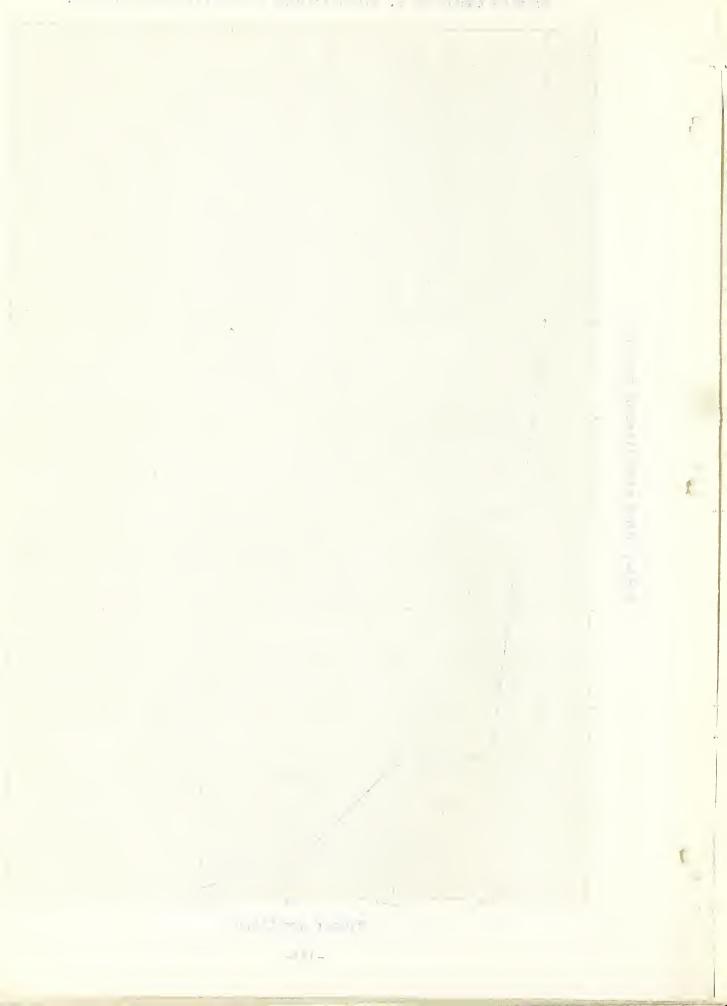
elile - elile epigli-elile gerelagijanist vanoren	W	sibility indfall Density	3:40:: 8	28:H:13	O: I	31:: 9	2.M :23	L 0	19::17	5:I:	
ssanced	Brush	Height Ft.	••	~	c-Rub: 4:30:L	N	on : 3:12:M	c-Lon: 3:40:	3c-Rub: 23:1	ch-Vac: 3:25	••
ds Reconnaissanced	distinction of the state of the	Genera	120:120:Vac-Sal-Ep	42:Sal-Ep-Aln	44:Aln-Sel-Fec-Rub:	20:Aln-Sal-Rub-Pac:	. Vac-Tax-Lon	46.Aln-Ech-Vec-Lon:	11. Pac-Tax-Vac-Rub: 23:	:Tax-Pac-Ech-Vac	
al Lands	ses per	Total Viscoss.	20:120	30: 42	58: 4th	8: 20	w 	94:			13: 27
all Federal	Ribes	Lac.	80: -:1	:339:12:	366:16:	362:12:	~ ~	343:46:	504:11:	738:18:	
FOT	0	white Pine No.	:120:	1	84:267:2366:16	85:200:106:1362:	36:	85: 11:	112: 17:	96: 3:	• •
TABLE XXV	per	White Ohine No. Mixed No.		1	16: 66:	33: 85:	5:126:	74: 9	01: 6:	13. 4.	••
Tar Timber	Timber	ine s No.	1	-100	: 17:	: 33:	1		:21:101	. 6:113	••
by		mature ra White Fine pr. Ave. DBH :		ı.ήZ	10"-12"	12"-14"		had done dollar	16"-24"	2211-2811	
Summary of Conditions	Chai	## #* #* D* ** * *	11: 1:	3842: 778:	4955:2212:	2826:1099:	53: 106:	350: 56:	7532:2399:	57: 1427:	:22,106:7078:
ary of	··· ··	# E E edication	9:							1: 2537:	:22,10
Summ	TYP.	e	• •	F-C-: A1	-DF :A11:	DF-: A11:	-VF :A11:	F-WP:A1	WF- : All:	:A11:	• •
and the second s	Timber Stend	Composition:	WP-C-H	: WP-WE-DF-C-: All: :H-S-LP-L	H-S H-S	WP-C-H-DF-	WP-H-DF-WF	: S-C-H-IM-WP:All:	100-200: WP-H-C-WF-	: C-H-%	•
to per Anno million edigoritament	Timb	Age Class	0-10	10-20	20-102	09-01	08-09	80-100	100-20(1- 002	Total.

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		1ty (2) %	Windf Dens Hei
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100-500	20-100 10-60 20-100 20-100	10-50 CI528	



Number Ribes viscosissimum per acre

Timber Age Class



- 1.Referring to Table 25 it appears that the number of Ribes per acre increases with density of bush up to a density of 40%. This is logical, since Ribes is a deciduous bush.
- 2. The number of R. viscossissimum is greatest in the 0-10 year class, and decreases to 2 per acre in the 60-80 year age class, after which it is shaded out.
- 3. The number of R. lacustre is more dependent on abundant moisture conditions, and is found in every age class along streams, except in the 0-10 year stand. In this latter age class, no stream was found.

Table 26, shows a summary of Ribes conditions by eradication types.

TABLE XXVI
Ribes Conditions by Eradication Types on Federal

		Area Re	connaissance, 1924.			
Eradi catio Type	n:Acres	tu ac	Brush Genera	Density &	Windfall	Visibility (Feet)
1	: 1791:	461:88:1 ¹ / ₂ :8	S9½:Rub-Aln-Sal-Ech	3½:35:	Read State	9
2	7877	2323: 2::	. 2:Pac-Tax-Vac-Aln-Rub-Ech	2:17:	L	17
3	5711:	2128:14:24:	38:Aln-Sal-Acer-Rub-Pac-Vac	4:54:	M	8
4	2289	812:12:12:	24: Rub-Aln-Sal-Vac-Pac-Tax-Lon:	4:29:	M	9
5	759	652: 3:14:	17:Pac-Vac-Aln-Rub-Tax	3:14:	L	14
6	3633:	688: 7:33:	40:Sal-Ep-Aln	3:30:	Н	15
7 All		14:69:: 7078:14:13:		4.40		9

An exemination of Table 26 shows that over 1/3 of the area lies in Eradication Type 2 with an average of 2 R. lacustre per acre. This is the cheapest type to work. Eradication Type 1, the stream type, probably the most expensive, covers only 8% of the area.

V Analysis of Time

Table 27 shows how the time spent on reconnaissance on Federal lands was divided.

- leferring to lable 25 it appears that the number of libes por core increases with density of 40, . This is legion, since libes is a decidnous bush.
- 2. The number of 3. viceessissimum is prechest in the 0-10 year class, and decreases to 2 per acre in the 10-80 year ago class, after infactive shaded out.
- b. The ancher of the lacestre is here dependent on shandant moisture conditions, and is found in every age class shong stream encept in the C-10 year stand. In this latter age class, no stream was found.

Tuple 26, rows & serum of lipes conditions by eradication

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TABLE XXVII

Analysis of Reconnaissance Time Spent on Federal Lands,

June 16, 1924 to Sept. 14, 1924

Type of Work	Man	Days :	: Percentages				
Reconnaissance Strips	239 2	9	41.4				
Traverse	26	•	4.5				
Mapping	382 -	•	6.7				
Training : Total actual work :	83	367:	14.3	66.9			
Travel, Camo Making, Packing:	98	98:	17.0	17.0			
Rain	36		6.2				
Sundays, Holidays	57	,	9.9				
Total ho work :		93 :		16.1			
Grand Total	578	578 :	100	100			

In addition to the above time, and not included in it, is an item of 55^{1}_{2} days spent in fighting fires, paid for by the Forest Service, except 2^{1}_{2} days of Supervisor's time paid for by Office of Blister Rust Control. Mearly 9% of the time was devoted to fire fighting. The men were on 8 different fires during the summer.

From Table 27 certain observations may be made.

- 1. There was a relatively high percentage of time, 14%, spent in training the men. This was due to the fact that to all the recommaissance men, this work was entirely new. In order to obtain the right perspective for blister rust reconnaissance, it was necessary for the men to work in eradication crews for several days. At the end of the training period, the men consecutively ran the same reconnaissance strip. The results were compared and talked over, with the end in view of correlating data taken by each crew. On the first of August, the idea of eradication types was evolved. The reconnaissance men worked in the eradication crews for two or three days on the different eradication types in order to become familiar with such types. In future work it is probably that it will not be necessary to devote so much time to training men.
- 2. Practically 67% of the time was spent in actual work giving results on the ground.
- 5. 17% of the time was devoted to travel, making camps, back packing, carrying supplies etc. Camps had to be moved quite often in order to cut down time spent in walking to and from work. The men

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2. I rendically 37, of the time was apont in addal word

3. 17% of the time was devoted to travel, rather outps, back packing, carriary supplies etc. "Lamps in d to he moved make outen, in order to east don three spent in malling to the free. For a time spent in malling to the free.

established seven camps during the recommaissance season. Camp sanitation was taken care of following Forest Service rules, by constructing suitable latrines and burying all tin cans and camp refuse. Considerable time was also spent in bringing in supplies by back packing to camps not reached by horse trails.

Table 28 gives the salary, subsistence and transportation costs of the men.

TABLE XXVIII

		Co	st	s of Rec	onnai	SS	ance Mer	n Working	on	Federal L	ands
No.			:1	Tonthly:	No. o	f:	Total :	}	:		:Total
llen	:	Position	. 1	Salary:	days	:	Salary :	Subsister	nce:	Transport	: Expense
1	;a	-Superviso	or:	225.00:	5	0:	375.00:	54	.57:	8.85	: 438.22
1	:	Recorder	:	100.00:	8	5:	283.33:	92	.06:	9.80	: 385.19
1	:	11	:	100.00:	7	4:	246.67:	77	.69:	9.80	: 334.16
1	:	17		90.00:	7	2:	216.00:	77	.12:	9.80	: 302.92
1	:	14	:	90.00:	3	9:	117.00:	45	.83:	4.90	: 167.73
1	:	Mapper	:	90.00:	2	9:	78.08	34	.67:	Ъ	: 112.75
1	:	Helper	:	70.00:	2	6:	60.67	34	.56:	4.90	: 100.13
1	:	14	:	70.00:	7	9:	184.33:	90	.12:	9.80	: 284.25
1	•	89	:	70.00:	55	2:	129.50:	54	.74:	9.80	: 194.04
1	:	tt	:	70.00:	- 1	1:	25.67	12	. 38:	b	: 38.05
1	:	T f	:	70.00:	6	0:	140.00:	63	.52:	4.90	: 208.42
	T	ota	1	10-4 Telegrapes	c-580	7	1856.25	637	.06:	72.55	:2565.86

a.-Represents half of Supervisor's time. Remainder charged to reconnaissance work on State lands.

b. -- Transportation paid for by Eradication.

c.--Total includes $2\frac{1}{3}$ days of fire fighting done by Supervisor and paid for by this Office.

Subsistence costs are based on the following costs per man day:

Cost per day, cook furnished -- \$1.23 Cost per day, without cooking charge--.97

The subsistence cost includes the transportation charges of the food supplies.

TABLE XXIX

Total	Costs,	Reconnaissance,	Federal Lands	
Items		: 0	osts	
Salaries	-	\$1856	.25	
Subsistence		637	.06	
Transportation		72	•55	
20% of Property		35	•70	
Total		2601	56	
			*	

establis of seven camps anding the proof of the sunitation was taken care of foldowing age ervice roles, by constructing smitchle letrines and burging all ting and camp : fuse. Considerable time was also spent in bringing in straines by book technology to camps not reached by horse trails.

VI Costs of Coom iscence also notagro promine calculations, and cortinuo of cevi all alded of the men.

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8.85: 458.22	:73.25	:00.676	:03	225.00:	:20	-tmervis	ß;	1
9.80: 585.19	:30.88	285.58:	:38:	100.001	:	Recorder	*	I
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9.80% :08.8	: L.L. 1787	:04.8.08	:37	:00.08	:	9 8	:	L
4.90: 187.73	45.04	117.00:	: 01.	:00.00	:	\$7	*	I
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9.00: 194.04	54.74:	122.50:	ः विद	70.00:	:	2.5	:	Ī
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72,55:2565,86	:50.708	1850.05:	::5005-0) 3	I	a + 0	S.	

a .- We muse must bould of weervisor's time. In since on and to recommaissance vru on State lands.

b .-- Arans or tation paid for it indication.

c .- lotal includes Lig days of directing one o passwinger and paid for bothis Office.

Subsistence costs are based on the Toll wing costs our man (a):

Cost per lay, cook furnished -- 1.25 Cost per day, vithout conting charge--.97

the subristence cost includes the transmittion out applications of food supplies.

- under an A de	See A see
econnaissance, Telegral Famus	_ayao: fato'
2520C	Items
J. 866 . A. 5	Jalaries
5.77 06	Subsistence
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Transportation
55.7C	20% of Property
2601.50	TetoT

Property consisted of non-expendable supplies such as scientific instruments, bedding, tents, etc., used by reconnaissance men working on federal lands. 20% of the total was charged against this year.

Cost per acre-\$2601.56 \$.117 per acre 22106 acres

D.(3.52) Results of Control Reconnaissance on Two
Areas in the Priest Lake Timber
Protective Association Lands, Ida.

During the summer of 1924 there were four crews of two men each doing control recommaissance on lands in the Priest Lake Timber Protective Association. Four of the men were paid by the Association, and four by this Office. One of the crews, besides doing reconnaissance work, was also doing educational work among the field employees of the Association. All four crews were scouting for the disease. The crew doing educational work reconnaissanced 7 small areas, in different parts of the Association while the remaining 3 crews confined their efforts to making a reconnaissance of two larger areas. A summary of all the reconnaissance work done in the Association is given in page159 "Results of Summer's Wor,k on Priest Lake Timber Protective Association."

This report gives in a more detailed way the results of reconnaissance performed by the 3 crews on the two large areas. These two areas are as follows:

Area No. 1—East of Upper Priest River 9108 Acres Area No. 2—Two Mouth Creek Drainage 11,224 Acres

I Area No. 1 Bast of Upper Priest River

This area occupies all or part of the following sections:

- T. 64 N-R. 4W-Boise Meridian, Idaho Sections 17, 18, 19, 20, 30 and 31
- T. 64 N-R. 5W-Boise Meridian Sections 22, 23, 24, 25, 26, 27, 34, 35 and 36.
- T. 65 N-R. 4W-Boise Meridian Sections 6, 7, and 18
- T. 63 N-R. 5W Sections 1, 2, 5, 11, 12 and 13

The location and limits of this area are shown on the map.

Accessibility

A good horse trail runs thru this area from the head of Upper Priest Lake north paralleling Upper Priest River & to 1 mile east of it. Property consisted of non-empendable - place sone a scientific instruments, bedding, tents, etc., ored by recounting reaction conting on federal lance. 20% of the total was charged at institute rear.

Cost pur mere 12601.56 - .117 per mere

.(L.58) Results of Control second issuad on two Areas in the richt Lake limber rotective insulation terms, the.

paring the same of 1924 there were onted onto one of the met deficient gentrel recommissione on lands in the Triest late inher Protective insociation. Four of the menture will be the issociation, and four by this Office. One of the erews, benices of the decommissione well, the also deing educational work among the field on loyees of the association. All four crews were scouting for the fiscase. The crew doing educational work recommissioned? Amail areas, in different parts of the Association of the remaining become confined their effects to making a recommission of two larger areas. In several of all the recommissione of two larger areas. In several of all the recommissione for two larger areas.

This report gives in a more detailed may the results of recommissance performed by the begrews on the two lur o areas. These two areas are as follows:

Area 10. 2-170 fout President iver \$100 Acres

I Lirea ? c. 1 . . . of Topon riest River

This crea occupies all or part of the following sections:

- 1. 64 1-1. 4 -- Duise Maridian, Lario Betions 17, 18, 18, 20, 50 and 21
- 7. 64 1-2. 5 -- Boise Oridian Jeotiems 25, 25, 26, 27, 18, 25 and 26.
 - N. 65 11-2. 4 -- 30ise Pridich
 - # 63 1 -- 2. 5. 1000 to all 12 and 15

The location and limits of this are and sign of the map.

Accessibility

reposition to the fact of the first first from the fact of the cast of its or the fact of the fact of

The northern portions of the area could well be worked from a camp on Cedar Creek at the trail crossing in the western half of Section 23.

Another excellent camp site on Gedar Creek is on the trail to Continental Mine at McLean Mine, Section 13, where there are two deserted cabins, one of which has a cook stove and fireplace. There is a good spring of water near by.

Good camp sites occur in Section 18 on the south fork of Cedar Creek. It would be necessary to construct a trail up the south fork.

South of Cedar Creek to Upper Priest Lake there are no good camp sites, along the trail owing to the scarcity of water. Both Snow and Ruby Creeks dry up in the summer time near their mouths. To cover the western portions of the area it would be necessary to construct trails west of the main trail, and make camps on the Upper Priest River, along which there are several good camp sites.

On Ruby Creek, near the eastern boundary of Section 2, is a good site for a base camp. About 4 mile of trail would necessarily be constructed to connect the camp with the main trail.

It is difficult going up either Snow or Ruby Creeks. Probably it would be necessary to depend on fly camps to cover the upper portions of either of these streams.

Acres Reconnaissanced

Table 30 shows the number of acres of each eradication type in each timber age class.

TABLE XXX

Number of Acres Reconnaissanced by Eradication Types and Timber

TIOUTION	0.		0 11000			771 111	1) PPEY	TI TOOD WHA THE	1001
Age	Cla	sses	in Area	a No .		East	UPPET	riest River	
Age Class	:_		Eradi	cation	Type			:% of area in e	ach
Timber	:	1:	2:	3:	4:	6:	Total	:Timber Age Cla	ss
0-10	:	77:	*****	304:	-	151:	538	: 5.9	
10-20	:	212:	:	1394:	3098:	***	4704	: 51.7	
20-40	:	10:	:	287:	425:		722	: 7.9	
40-60	:	5:	491:	:		:	496	: 5.4	
100-200	:	372:	1120:	:	Transport 0	***********	1492	: 16.4	
200 🛨		258:	898:		:	:	1156	: 12.7	
Total	:	934:	2509:	1985:	3523:	157:	9108	:	
% of total	. :	:		:	:	:		•	
area in ea	ch	10.3:	27.5:	21.8:	38.7:	1.7		: 100	
Erad. type	:	:	:	:	:	:		:	

The nerthern ortions at the arcs could well se order from a carr on deler trotte frances on deler trotte of section 25.

inct on one plant carried out offer the car is on one trail to consider the carried time that the continuation into the carried out in one of this has a good store and direplace. There is a good soring to twiter near the or.

Tool composites obear in dection 18 on the continuous of the sarth force of the sarth force of torus.

loude of the trail or typer Priest Wise plane are no comerny siter, the trail or or to the scarcit of with r. Toth drov and Ruby Greets lay uptin the summer time now their nouths. To cover the restor portions of the area it tothe be researed to construct trails wout of the main trail, and make cance at all Upper Triest River, short which there are several good came sites.

On Tuby Green, near the castern boundar of Section 2, is a good site for a base cars. Thout of nile of trail would necessarily be constructed to connect the cars with the main trail.

It is difficult joing up either Snow or Ruby Greeks. Probaditions it would be necessary to depend on fly camps to cover the upper portions of either of these streams.

Acres Recommetalmeed

Rable 30 shows the number of acres of each exadication type in each timber see class.

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The following facts may be observed from Table 30.

- 1. Over half of the total area is occupied by a 10-20 year timber age class.
 - 2. Nearly 39% of the acreage is in Eradication Type No. 4.
- 3. Eradication type limits and timber age class limits do notnecessarily co-incide.

White Pine and Ribes Factors.

Tables 31 and 32 show the white pine and Ribes conditions on the area.

the fullowing facts a clobs were the ble 50s

- 1. Ov. real of vectors area is occared by 10-20 our timber are class.
- 2. We rig 55, of the serence is in Errice tirm the No. 4.
- . D. Tradic ticn type lints and timber age class linits do notnecessarily co-incide.

Mite Fine and Tibes Determs.

Unbles 31 and 52 slow Me lite pine and libes conditions on the area.

TA BLE XXXI

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Explanation of abbreviations used in all tables.

Timber

D-cedar; D.F.--Douglas fir; H.-hemlock; S.--spruce; W.P.--white pine; W.F.--white fir; L.--Jarch; L.P.--lodgepole pine.

Rush

Acer-Acer circinatum--vine maple

Aln -Alnus species -- aldus

Cean-Ceanothus species-buck bush

Ech -Echinopanax horridum -- Devils Club

Ep -- Epilobium angustifolium -- Fireweed

Lon -- Lonicera spp. -- wild honeysuckle

Menz-Menziesia Ferruginea

Pac -- Pachistima myrsinites

Rhod-Rhododendron Albiflorium

Rub -- Rub species -- thimbleberry, raspberry

Sal -- Salix species -- willow

Tax -Taxus brevifolia-western yew

Vac -- Vaccinium spp. -- huckleberry

Windfall

H--Heavy windfall

M-Medium windfall

L-Light windfall

- Windfall practically absent

Ribes

R. viscoss. - R. viscossissimum

R. lac. -- R. lacustre

R. acer. -- R. acerifolium

An examination of Table 31 shows the following conditions:

- L. On this area, the best stand of white pine consisting of poles and reproduction is found in the 0-10, and 10-20 year age classes.
- 2. The best stend of mature white pine occurs in the 100-200 year age class, where it constitutes 17% of the mature trees.
- 3. White pine poles and reproduction are scarce in the 100-200 and 200 + year age classes.
- 4. The largest number of Ribes per acre are found in the mature stand along streams, in which situations there were found 332 R. lacustre per acre.
- 5. No Ribes and few white pine were found in the 40-60 year age class.

Explanation of abbreviations used in all tables.

Timber

D-ceder; D.F. -- Douglas fir; H. --hemlack; S. --epruce; W.P. --white pine; W.F. --white fir; L. -larch; L.P. --ladgepole pine.

Fash

Acer-Acer circingtum-vine maple
Aln —Alnus species—aldee
Cean-Ceanothus species—buck bush
Ech —Echinopenax horridum—Devils Club
Ep —Epilobium angustifolium—Fireweed
Lon —Lonicera spp.—wild honeysuckle
Menz-Menziesis Feruginea
Pec —Pachistims myrsinites
Rhod—Bhododendron Albiflorium
Rub —Pub species—thimbleberry, respberry
Sal —Salix species—willow
Tax —Taxus brevifolis—western yew
Vec —Veccinium spu,—huckleberry

Windfell

H-Heavy windfall

M-Medium windfall

Light windfall

windfall prectically absent

Ribes

E. vircoss.—R. vircossissimum
R. lac. —R. lacustre
R. acer. —F. acerifolium

An examination of Table 31 shows the following conditions:

1. On this area, the best stand of white pine consisting of poles and reproduction is found in the 0-10, and 10-20 year age classes.

2. The best stand of mature white pine occurs in the 100-200 year age class, where it constitutes 17% of the mature trees.

3. White pine poles and reproduction are scarce in the 100-200 and 200 + year age classes.

4. The largest number of Ribes per acre are flound in the matustand along streams, in which situstions there were flound 332 R. lacustreper acre.

5. We Ribes and few white pine were found in the 40-60 year age class.

- 6. Practically no R. viscossimimum was found in timber age classes older than the 20-40 year age class.
- 7. R. lacustre was found in every timber age class except the 40-60 year age class, chiefly along streams.

Table 32 gives a summary of Ribes conditions by eradication types on this area.

TABLE XXXII

Ribes per Acre by Eradication Types Priest Lake Timber Protective

Association. East of Upper Priest River

			provedented -
: : Chains : Ribes per Acre : Brush Erada: : of : : : : : : : : : : : : : : : : :	· ·	Windf	Bisibi
Type :Acres:Reconn.: R. : R. :Total: Genera :Ht.: I : :Strips :lac.:vis- : : :Ft.:	4	211	lity
1 934: 447: 143: — : 143: Pac-Vac-Sal-Ech-Eerns: 3:	24:	L:	9
2 : 2509: 551: Few: : Pac-Vac-Ferns 2:	23:	L	11
3: 1985: 484: 19: 15: 34:Sal-Pac-Vac-Rub 4:	28:	M :	g
4 : 3523: 352: 8: 16: 24:Sal-Pac-Aln : 4:	28:	M:	11
6: 157: 33: 15: 34: 49:Sal 4: 411: 9108: 1867: 22: 10: 32:	33:	L:	10

An examination of Table 32 shows the following conditions:

- 1. Type 1 shows the greatest number of Ribes per acre, followed in order by Type 6, Type 3, Type 4, and Type 2.
 - 2. R. viscossissimum is confined to bushy slopes associated with Salix species, Eradication Types 3, 4 and 6.
 - 3. R. lacustre is found in all eradication types.

II AreaNo. 2—Two Mouth Creek Drainage
This area occupies all or part of the following sections:

- T. 62 N-R. 3W-Boise Meridian, Idaho Sections 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, and 34.
- T. 62 N-R. 4W-Boise Merdian, Idaho Sections 13, 14, 15, 22, 23, 24, 25, 26, 27, 34, 35, and 36.

- 6. Practically no R. viscossimimum was found in timber age classes older than the 20-40 year age class.
- 7. R. lacustre was found in every timber age class except the 40-60 year age class, chiefly along streams.

Table 32 gives a summery of Ribes conditions by eradication types on this area.

:
PABLE XXXII

Ribes per Acre by Eradication Types Priest Lake Timber Protective
Association. Hast of Upper Priest River

ARTON PORT PORT	-	Service and Personal	productive con-linearing and an analysis of the control of the con		or ellers the main office an		- The contropolation of the Control	The second second	still be the strate order. The reduction by	and the control of
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:1	33:	: 41	: Is	2:6	भ	34:	15:	33:	: [13]:	9
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An examination of Table 32 shows the following conditions:

- 1. Type 1 shows the greatest number of Ribes per acre, followed in order by Type 6, Type 3, mype μ , and Type 2.
- 2. R. viscossissimum is confined to bushy slopes associated with Salix species, Eredication Types 3, 4 and 6.
 - 3. R. lacustre is found in all eradication types.

II ArezNo. 2-Two Mouth Creek Drainage This area occupies all or part of the following sections:

- T. 62 N-R. 3K-Boise Meridian, Idaho Sections 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, and 34,
- T. 62 N-R. 4W-Boise Merdian, Idaho
 Sections 13, 14, 15, 22, 23, 24, 25, 20, 27, 34, 35, and
 36.

Accessibility

This area borders on Lower Priest Lake. An excellent base camp site is located on Huckleberry Bay in the northern part of Section 35. There is a good beach, spring, and dry ground. It is about 16 miles by water from Coolin and is connected with Coolin and Byers' ranch by a horse trail.

Approximately three miles of good horse trail were constructed up Two Mouth Creek in 1924. There are two good camp sites on this trail. It is expected that the trail will be continued for three or four miles further.

At present there is simply a foot path, mostly along logs, up to the headwaters of Two Mouth Creek. Good camp sites are located in Sections 30, 29, 28, and 27.

In the north west quarter of Section 26 is found a trapper's cabin in good condition.

In the north western portion of the area are found several good camp sites along the lake, and along the trail.

Acres Reconnaissanced

Table 33 shows the number of acres reconnaissanced by timber age classes and eradication types.

TABLE XXXIII Acres of Timber Age Classes in Each Eradication Type.

Timber Age : Eradication Types, Acres : % of Area in each Class : 1 : 2 : 3 : 4 : 5 : 7 : Total : Timber Age Class.
THE PART OF THE PA
10-20 : 17: - : 65: - : - : 82 : 47
20-40 :-: -: 287: 256: -: 543: 4.9
40-60 : : : 164: 30: : 194 : 1.7
69-80 : 22 : : : 170 : : 273 : 465 : 4.1
100-200 :569 :8927 ::: 444: 9940 : 88.6
Totals :608:8927:65:621:286:717:11,224:100
% acreage in : : : : : : :
each Erad. Type: 5.4: 79.5: 16: 5.5: 2.6: 6.4: : 100

An examination of Table 33 shows the following facts:

l. This area is principally occupied by mature timber. Practically 80% is in Eradication Type No. 2, Ribes free; and nearly 90% in a mature aged stand.

Accessibility

This area borders on Lower Priest Lake. An excellent base camp site is located on Huckleberry Boy in the northern part of Section 35. There is a good beach, spring, and dry ground. It is about 16 miles by water from Coolin and is connected with Coolin and Byers' reach by a borse trail.

Approximately three miles of another trail were constructed up Two Mouth Creek in 1924. There are two good camp sites on this trail. It is expected that the trail will be continued for three or four miles further.

At present there is simply a foot path, mostly along logs, up to the headwaters of Two Mouth Creek, Good carr sites are located in Sections 70, 25, 26, and 27.

In the north west quarter of Section 26 is found a trapper's cabin in good condition.

In the north western portion of the area are found several good camp sites along the lake, and along the trail.

Acres Acconnaispenced

Table 33 shows the number of scres reconnaissanced by timber age classes and ergdication types.

TABLE XXXIII Acres of Timber Age Glasses in Bach Bredication Type.

	Two Mouth Creek
& of Area in each	Timber Age : Eradication Types, Acres :
Timber Age Class.	Class : 1 : 2 : 3 : 4 : 5 : 7 : Total :
17	10-20 : 17: - : 65: - : - : 82 :
0 1	20-40 :-: -: 287: 256: -: 543:
1.*[40-60 ::: 164: 30:: 194:
I of	: 22 : -: 170: - : 273: 465 :
88.6	100-200 :569 :8927 :::: 4141: 5940 :
COL	Totals : 503 : 8927 : 55: 521: 285: 717:11,224 :
Section 1 and 1 an	\$ screege in : : : : : : :
COL	each Erad. Type: 5.4: 79.5: 16: 5.5: 2.6: 6.4:

An examination of Table 33 shows the following facts:

1. This eres is principally occupied by mature timber. Practically 80% is in Eradication Type No. 2. Riber free; and nearly 90% in a mature aged stand.

White Pine and Ribes Factors

Table 34 and 35 show the white pine and Ribes conditions on this area.

The following conditions are evident from an examination of Table 34.

- l. The largest amount of mature white pine occurs in the 100 to 200 year age stand, where it makes up over 15% of the mature trees by count.
- 2. The 10-20 and 20-40 year age classes show a good white pine pole and reproduction stand.
- 3. There is an understory of poles in the mature stand, as evidenced by the 115 poles per acre.
- 4. Brush is relatively light on this area. The highest density is found in the 60-80 year age class along streams. The largest number of Ribes per acre, 206 R. lacustre is also found in this situation.
- 5. R. viscossissimum is found in every age class except the 10-20 year age class. This is probably due to the quite open type of timber growth occuring on the area.
 - 6. R. lacustre is found in every age class.
- 7. Nearly 80% of the total area, or 8927 acres show an average of one R. lacustre per acre. This would be a relatively inexpensive area from which to eradicate the Ribes.

Table 35 show the Ribes condtions by eradication types.

White Pine and Ribes Factors

Table 34 and 35 show the white pine and Ribes conditions on this area.

The following conditions are evident from an examination of Table 34.

- 1. The largest amount of meture white pine occurs in the 100 to 200 year age stand, where it makes up over 15% of the meture trees by count.
 - 2. The 10-20 and 20-40 year see classes show a good white pine pole and reproduction stand.
 - 3. There is an understory of poles in the meture stand, as evidenced by the 115 poles per acre.
- 4. Brush is relatively light on this area. The highest density is found in the 60-30 year age class along streams. The largest number of Ribes per acre, 206 R. lacustre is also found in this situation.
 - 5. R. viscossissimum is found in every sge class except the 10-20 year age class. This is probably due to the quite open type of timber growth occuring on the area.
 - 6. R. lacustre is found in every age class.
- 7. Nearly 80% of the total area, or 8927 acres show an average of one P. lacustre per acre. This would be a relatively inexpensive area from which to eradicate the Ribes.

Table 35 show the Ribes condtions by eradication types.

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2	* DF-WF-WP-H-C			71:	1	3	60: 3:	÷ ₩	15: 37	7: 2:32	į	: 34: Pac-Acer	er	+:24 :	+: M	:11
8	: WF-C-H-EP-WP	: 5:			1	:16:	:: Ot	80:	:405	: 4050::	**	-	20-0		. M	:10
Ave.	: DF-WF-C-WP-H-LP: All:	:A11:	194: 8	81:	14"-18"	: :	52: 3:	83:	13: 65	653: 2:27	1	: 29:Pac-Acer	er	: 4:20:	. M	10
8	· C-H-S-WE-WE	•• Fi	22: 1	13:	-	3:110:	10: 3:		64:6	490:206-	1	0	ď	: 3:31:	ы	91:
80%	WF-S-H-WP	: _† :	170: 5	:9:		ผ่	70::		: 10	104:34:	~	: 35: Vac-Lon-Rhod	n-Rhod	1:10:): M	:15
	*WF-S-H-WP-C	: 7:			-	: 3:	17: 5:	23:	39: 77	79:5年: 1	1:	: 52:Aln-Vac-Menz	c-Menz	: 3:15	5: L	6
Ave.	* WIN-S-H-WP	:A11:		247:	18"-24"	: 3:	41: 3:	23:	31: 49	493:54: 1		: 56:Aln-Vac-Lon-Ech	c-Lon-Ec	sh: 2:12	- F	10
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2002	*E-C-WP-WE-DE	2:892	2: 7	:6:		:21:1	10:	110:	41: 691	1: 1:-		: 1: Vac-Pa	: Vac-Pac-Acer-Lon	Low 2:18:	3: L	.27
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TABLE XXXV

Summary of Ribes Conditions by Eradication Types.

Two Mouth Creek Drainage

Erad. Type	: Acres: Re	-		R. :	R.:	otal Genera	Bit Fit	Windfall	Visibility
1	608	204:	34	4 :	1 :	39: Vac-Pac-Aln-Lon-Ech	3: 2 0:	L	12
2	8927	2629	1	in morning		1: Vac-Pac-Acer-Lon	2:1g:	L	17
3	65:	37:	25:	300	pandamon agric	25: Vac-Rub-Lon	2:15:	L	13
14	621:	288	10	13	Few:	23: Vac-Pac-Aln-Lon-app	3:20:	M	9
5	286:	63	10월			:Rhod 101:Vac-Rhod-Lon	3:10:	M	9
7	717:	460	29:	1	-	30: Vac-Aln-Pac-Rhod-	2:14:	M	18
Tota	1:11224	3681:	5:	1 :	Few:	6;			

Certain facts are evident from an examination of Table 35.

- 1. Ribes are relatively scarce on the entire area. The largest number of Ribes per acre are found in Type No. 1. In decreasing numbers of Ribes per acre the eradication types occur in the following order: Type 1, 7, 3, 4, 5, 2.
 - 2. R. viscossissimum is found in Types 1, 4, and 7.
 - 3. R. lacustre occurs in every eradication type.
 - 4. Bush density is low in every timber age class.
 - 5. Vaccinum species, huckleberry is the predominant bush.
 - III Summary of Conditions on Areas No. 1 and No. 2, Priest Lake Timber Protective Association.

Table 36 shows the number of acres reconnaissanced in these two areas by timber age classes and eradication types.

TAPLE XXXV Summery of Ribes Conditions by Fradication Types.

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13 :13	2:15:	Vac-Rub-Lon:	25:	#	Franchis Street,	:25	37:	:59	: 3
*	: :	a *	9			*	9	:	:
6: 9	3:20:	Vac-Pac-Aln-Lon- In:	: ₹S	rew:	13:	10:	288:	:139	:: 1
9	: :		-	*	*	:	*	:	•
6 : P	3:10:	Vac-Rhod-Lon:	10点:	9 mm year over	*	10를:	: 63:	:088	: 5
*	: ; :		*		4	*	1	:	8 0
31: N	2:14:	Vsc-Alm-Pac-Ehod-:	30:	g constraint	: [:62	:0947	717:	: 1
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Certain facts are evident from an examination of Table 35.

- 1. Ribes are relatively scarce on the entire area. The largest number of Ribes per acre are found in Type No. 1. In decreasing numbers of Ribes per acre the eradication types occur in the following order: Type 1, 7, 3, 4, 5, 2.
 - 2. R. viscossissimum is found in Types 1, 4, and 7.
 - 3. R. lacustre occurs in every eradication type.
 - 4. Bush density is low in every timber age class.
 - 5. Vaccian species, huckleberry is the predominant bush.
 - III Summery of Conditions on Areas No. 1 and No. 2, Priest Lake Timber Protective Association.

Table 36 shows the number of scres reconnsistanced in these two areas by timber age classes and eradication types.

TABLE XXXVI

Acres of Timber Age Classes in Each Eradication Type. Priest Lake Timber Protective Association Lands in Upper Priest River and Two

	Mouth Drainage.	
Timber Age :	Eradication Types Acres :% of Acreage in each	a
Class(Years):	1 : 2 : 3 : 4 : 5 : 6 : 7 : Total: Timber Age Class.	
0-10 :	77:: 304:: -: 157:: 538: 2.7	
10-20 :	229:: 1459: 3098::: 4786: 23.6	
20-40 :	10: - : 287: 712:256::: 1265: 6.2	
40-60 :	5: 491:: 164: 30::: 690: 3.4	
60-80 :	22:: 170::: 273: 465: 2,3	
100-200 :	941:10047: -: -: -: 444:11432: 56.2	
	258: 898: -: -: -: -: 1156: 5.6	
Total :	1542:11436:2050:4144:286:157:717:20332:	
% of acreage:		
in each Erad.	7.6: 56.2:10.1:20.4:1.4: .8:3.5: : 100.0	
Type :	: : : : : : :	

- 1. An examination of Table 36 shows that 56.2% of the total acreage in the two areas is mature, Ribes free. This is the cheapest type to eradicate.
- 2. Eradication Type 1, probably the most expensive to work, occupies 7.6% of the area.

White Pine and Ribes Conditions on the Two Areas.

Tables 37 and 38 show the conditions by timber age classes and eradication types on the two areas.

An examination of Table 37 shows the following facts:

- l. Practically 17% by count of the mature trees in the 100-200 year age class are white pine, with an average DBH of about 24 inches.
- 2. The 0-10, 10-20, 20-40 year age classes show the best pole reproduction stand of white pine.
- 3. R. viscossimum is the most abundant in the 10-20 year age class. It is very scarce or absent in age classes older than the 40-60 year stand.
 - 4. R. lacustre is present in all timber age classes.

TARKE XXXVI

Acres of Timber Age Classes in Each Eradication Type. Priest Lake Timber Protective Association Lands in Upper Friest River and Two

Equipment is a second of the s	The Control of the Co	des 1 Me	I will be set of	:03	BRIBE	uth D	om	s, - mai tribusciman sacce ma		ales. Authorithmostic relations from the
and Acreses in each										Timber A
Timber Age Class.	Total:	: 5	: 9	: (: 4	3:	: S	1 :	:(ars	Class(Ye
7.9	:252:	te anniuma B	157:	d	-	: 10E	÷	: 77:	# 4	0.0-0
23,0	11786:	d washing	9	#	:3008:	1459:	4	: 888	7	OS-OI
5.2	1.265:	S ann been	\$al	:992	712:	:785	9	:CI	4	OH-02
3.4	: 0690 :		* *******	:05	164:	* ****	:164	:5	4	09-04
8.3	: 465:	273:	å	2	170:	a		:55	d e	60-80
S.₽∂₹	:35411	मामाम	d	:	Ţ	¥	:74001	:146	1	008-001
5.6	:9511			A na.rey		å	895:	258:	;	+ COS
and the state of t	:20332:	717	157:	:389	: माराम	:0705	11436:	1542:	4	Total
	1			*	7	ě p	4	4	:0339	p of sci
€.00.	:	3.5:	.8:	:4.1	: 4.0S	:I.OI	:5.33	7.6:	Ered.	in each
	4		B 0	4	4	:		1	4	Type

- 1. An examination of Table 35 shows that 55.2% of the total screnge in the two aress is mature, Ribes free. This is the chappest type to eradicate.
- 2. Eredication Type 1, probably the most expensive to work, occupies 7.6% of the area.

White Fine and Ribes Conditions on the Two Areas.

Tables 37 and 38 show the conditions by timber see classes end eradication types on the two arest.

An examination of Table 37 shows the following facts:

- 1. Frectically 17% by count of the matura tress in the 100-200 year age class are white pine, with an average DEH of about 24 inches.

 2. The 0-10, 10-20, 20-40 year age classes show the best pole reproduction stand of white pine.
 - β_* A. viscossimum is the most abundant in the 10-20 year age class. It is very scarce or absent in age classes older than the 40-60 year stand.
 - 4. R. lacustre is present in all timber age classes.

TAPLE XXXVII

671

Jan 1

Summary of Conditions by Timber Age Classes on Priest Lake Timber Protective Association Lands, East of Priest River, and Two Month Creek Drainage Combined of Priest River, and Two Mouth Creek Drainage Combined.

To tal		200 +		100-200		60 8 80		00-0i		20-40		10-20		0-10			(Years)	Class	Age	13		
	- 1	· C-H-WP	••	100-200:H-C-WP-WF-DF-S		WIP-S-H-WP	••	: C-DF-H-WF-WP-LP: All:	••	C-H-WP-DH-WF-S		: WF-WP-C-E		: WP-C-H-WF-S	••	**************************************	··	: Composition	••	Timber Stand		
••	••	:All:	••	A11 :	••	:All:		P: A11:	••	:All:	••	:All:	••	: All:		ra		ca •••	ti	on	••	
:20,332:5548:	••	1156: 246:28"	••	114 32: 36 35: 20"	••	465:		690: 19	••	1265: 31	••	4786: 75	••	538: 130:	Č	ha	in	s is	Acres Ha	r	• •	
ÖQ	••		••	35:20"	••	247:18"	••	192:12"	••	347:10"	••	751: 8"	••	:0;	w .Per	r:No.1	P. Ave.	s.			••	1 4 4 0 5 6
		- 34"	-]	1 281	-	- 2)111	2	- 18"		121		1 10"		1	Tree	.61 Log	DBH an	White	Matu	Ti	4	100000
••	••	: 2:110: 2:	••	:19:103:10:100:383:	••	: 3: 41: 3:	••	:13: 90: 3:	••	: 6: 19:39:	••	: 1: 4:13:	••	:-: 2:20:	M N W	P	N		esting : Mature : Poles	Timber per Acre		Creek True Mile
	••	2:110: 2:151: 23: 679	••	100:38 : 671	••	3: 23: 31: 49	••	90: 3:107: 17:2307	••	19:39: 59:190:2018	••	22:259:1281	••	2:20: 11:159: 569:	M W M	o, P	ed .N	0.	es : Reprod.			0.00
:123: 5:	••	9: 4::-	••"	f: 13::-	••	5: 54: 1: 1:	••	2:63:-	••	5: 6:10::	••	1: 13:16::	••	9: 10::	R	. V	la	c.	••	: per Acre	Ribes	
: 17号:	: Tax-Ech	4: Ferns-Rub-Pac-	: Rhod	13: Vac-Pac-Aln-	:Rhod-Menz	56: Aln-Vac-Lon-Ech:	: Ech	7:Pac-Tax-Acer :	:Rhod-Rub-Lon	16: Pac-Vac-Sal-Aln:	••	29:Sal-Pac-Aln :	••	19:Sal-Pac-Cean	R	otip	al		: Genera :	Brush	••	
••	••	3:25: L:11	••	2:19: L:24	**	2:12: L:10	••	3:17: L:14		4:26: M: 831	••	4:28: M:10	••	4:30: M:12	D	Nt en Wi	ndib	fa il	11 it	y	••	

Same and the Conditions of Lines Age Classes on Priest Lake Timber Protective Association Lands, Rast Same of Lines the Condition of Infest River, and Iwo Wouth Creek Draines Combined.

		V866	CISES	arcey)			0-10		10-S0		50-110		JiO-90		のがようら		100-50		500 +		LetoT
	Dast Stand		* Composition	9.3	••		**************************************		15-0-E	**	2-11-11-11-11-12-2	> 17	· C-UI-H-WI-WE-TS-VII:	••	では、なりは、	**	100-500:国一0-35-36-36-3		で用事	**	And the state of t
**	ac	Ė	in:	310	er.	T	W W	30	1 T T T T T T T T T T T T T T T T T T T	4-3-	Sound Sound Printers	49	S. T.L.	7- ia	de d	**	454 bred bred	••	* VIII	9.6	0.5
0 0 0 0 0 0 0 0	re nc	FOLOD IC) 6 201	in:	eri son or paragori	0000	750	**	1000: 101: 0: -	20	1265; 347:10"	••	edo: Jos: Isn	**	FOR: Styl: IRn -	••	11)+25:3022:50n	**	JIPP: SHP:52" -	tir to	:20 -3325: 2242:
	-	प्रकृत्य	Wolfe Fine:	ve. DBE an	.No. 16 Logs: Wo. M.	er Tree	-		10 I		Ou - JSH		Si - 1.81		Ca - Sylva		011 - 5811		क्षा न अपंता		non-madifie, shifts Mentarditi an arealability
	Timber ner Acre			be	our steel 1	1			···	••	O. 19:	• •	:13: 00:	**		**	FOL: PI	••	: 5:170:	••	
	ACTE	: Poles : Reprod.		N.	y.	M.	S:50: 11:120:	**	\$3.555555 : 1255 # 1.5	**	19:39: 59:190:201	**	90: 3:107: 17:230	34	W. SW. WIT.	**	19:103:10:30:38}:	**	8:110: S:151: S3:	**	error implement orderer adjusts control or a
# Bipes	: Der Acre	90	40 0	is	. ol	N I	Dpd: 0: 10:	20	S8#: 13:10:	**	-: OI: 9 : SIC	**	101: \$: C\$: -	**	TO WAR		674: 13::-	**	679: H::-	14	CA
••	**	••	64	I e	100 100 11.29	\$6-91	Teso-cest-lession	70	-: Sd:281-580-VJD	••	• 1	-50 dA:	**	: Bob	I + 56:Alm-1	* : Bhod-Menz	-: IX: Vac-Pac-Alm-	: : Boog		for-xeT:	100
	neman	RISHOL				* * * * * * * * * * * * * * * * * * * *	#890-08#		GC-VJD		Ib:Fac-Vac-Sal-Alm:	Rel-duff-bodf:	T:Pac-Tex-Acer-		56:Aln-Vac-Lon-Heh:	Mena	-alla-		H: Berns-Sub-Pac-	SC T	Processing Application over semination foreign stage
the sile.		i.			Nt.	I	SI:M:OS:H:	00	OF: M: 255: H: 10	**	1.256: M. 812	94	Wall of Today	99	: S:JS: T:JO	**	: 5:13: 1:5t	**	. Sich: Lili	1970	of the state of th

TABLE XXXVIII

Summary of Ribes Conditions by Eradication Types, Priest Lake Timber Protective Association, East of Upper Priest River Area, and

		Tv	vo Mou	th (reek	Area	
Erad.		Chains :		bes pe	er Acre	Brush	Wi Vis
	:Acres:1	Reconn.	:	R. :	R. :	Genera	ibility ndfall Den. %
1	1542:	651	992:	11/2:	के हैं:	1012: Pac-Vac-Sal-Aln-Ech-	3:22:L:10
2 -	11436:	3180	1:	gentk		:Lon 1:Vac-Pac-Rub-Lon	2:19:L :16
3:	2050:	521	19:	141:		: 33½:Sal-Pac-Vac-Rub-Lon	#:58:W : 8
އ	4144	640	8	15½:	:	232: Sal-Pac-Vac-Aln-Lon	4:27:M:11
5	286:	63	10½:	-	aumbirms 0	: Rhod 10½: Vac-Rhod-Lon	3:10:M:9
6	157	* 33	15:	34:	-	49:Sal	4:33:L:10
7 ***	717:	460	29:	n 1:	pang-red 0	30: Vac-Aln-Pac-Rhod-	2:14:M :18
Total	:20332:	5548	121:	5:	paramy 8	174	

An examination of Table 38 shows the following facts:

- 1. The largest number of Ribes per acre is found in Type 1. In order of decreasing abundance of Ribes the eradication types fall into the following order: Type 1, 6, 3, 7, 4, 5, and 2.
- 2. R. viscossissimum is found in all eradication types except Type 2 and Type 5.
- 3. R. lacustre occurs in every eradication type.
- 4. Salix species appear to be the chief associates of R. viscossissimum.
- 5. Brush is relatively sparse. There seems to be no definite relationship apparent between density of bush and number of Ribes per acre.
- 6. Type 2, which is the cheapest type to work, occupies over 56% of the area, with an average of 1 R. lacustre per acre.

IV Analysis of Reconnaissance Time
Table No. 39 shows how time was spent by reconnaissance men.

11.17

TABLE XXXVIII

Summery of Ribes Conditions by Eradication Types, Priest Lake Timber Protective Association, East of Upper Priest River Area, and

Two Month Creek Ares

	e mant sort any alasmes or only two of			SOLA	2071	. U Lid	D UEE C	1.64 T		
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SU :		and other	yanıg	:	r Acre	ec sec	IA	: ?:	0:	Erad.:
		*		:	:	*	*	econn.:	Acres: B	Type:
harry 3	E 18 E	8	Genera	:	P. :	B.	R. :	: agint	8:	*
52	long the	*		:Isto	P: .Tec	isc.:30	lac: v		*	4 5
and an alternati			Arma - grison i sarri s rimanangana angkalappanantistana dipipingan dapagaran - e one masangan		# # # *****	B B our laters gave consistent	# 0 - min	d consequences	-4 -4	B B Specifical Conference on the Conference on t
O.I.	3:22:Σ	* *	Pac-Vac-Sal-Alm-Reb-		北 徳	:81	395:	: 159	1542:	: 1
- i	1 1	9	noi		*	4	:	*	:	0
01:	2:19:E	9	Vac-Pac-Rub-Lon	1:1	B Barrisman	g project	1:	3180 :	11436:	: S
200	: : :	0		3	:	1.10	:	# # PA PA	* **	
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ikuli i			Sal-Pac-Vac-Aln-Lon Rhod	6.2 40	d and some	. gC 7	. 0	: 040	:++1+	3 12
0	3:10:M	9	Mac-Rhod-Lon				10%:	: 29	286:	. 7
6 '			HOLL-HOLL Ole (.gor			. 802	. (0	,003	
615	4:33:5		[a]	:64	*	:45	15:	: 22	157:	. 3
5, 0- 6			# 33 W		9		4 18 10.	. 60	. 10-	
18	Z:14:M	*	Vac-Aln-Pac-Rhod-	30:	* ******	1:	:62	: 004	717:	· T
			Zuoy				:	:	:	•
Therefore as 1000			ANG LOSS BY ET ANY WAY A SHARMAN MARKET WAS SETTING THE WAS A SETTING THE WAY A SETTING THE WAY A SET IN SETTING THE WAY A SET IN SET IN SETTING THE WAY A SET IN SET IN SET IN SET IN SETTING THE WAY A SET IN	171	g personal	: (3	123:	5548:	20332:	Totali
married married and	THE R. LEWIS CO., LANSING STREET, LANSING SQUARE, NA	mil' tradi-	AND THE RESIDENCE AND ADDRESS OF THE PROPERTY	a stational regulation regulation	non servicements housest	manual schlieber a spens	April 1 cities militari imperior de transporte	the second second second second	and the second section is a second	ALTO TO THE RESIDENCE OF THE PARTY OF

An exemination of Table 38 shows the following facts:

- 1. The largest number of Ribes per acre is found in Type 1. In order of decressing abundance of Ribes the eradication types fall into the following order: Type 1, 6, 3, 7, 4, 5, and 2.
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- 5. Brush is relatively aparse. There seems to be no definite relationship apparent between density of bush and number of Ribes per acre.
 - 6. Type 2, which is the cheapest type to work, occupies over 56% of the area, with an average of 1 E. lacustre per acre.

IV Analysis of Reconngissance Time Table No. 39 shows how time wer spent by reconnaiss nce men.

TABLE XXXIX

Analysis of Reconnaissance Time Spent on Area No. 1 and 2, Priest Lake Timber Protective Association, June 16, 1924 to

Septemb	er 20,	1924.		
Type of Work :	Man	Days	: Perc	entages
Reconnaissance Strips :	225		: 43.0	•
Traverse :	32불		: 6,2	
Mapping :	23		: 4.4	02111111
Training	75=		: 14,4	
Total Actual Work :		356	:	68.0
Travel, Camp Making, Packing:	79	-79	: 15.1	15.1
Rain, no work :	32		: 6.1	1
Sundays, Holidays :	56글		: 10,8	
Total, No Work :		88 <u>1</u>	:	16.9
Grand Total :	523	523½	: 100.	100.

Of the total 523 man days spent on reconnaissance on the Priest Lake Timber Protective Association, 193 man days were furnished by the Association, and 330 man days by the Office of Blister Rust Control.

In addition to the $523\frac{1}{2}$ days and not included in it, is an item of $48\frac{1}{2}$ days spent in fighting fires, paid for by the Forest Sevice, except $2\frac{1}{2}$ days of Supervisor's time paid for by the Office of Blister Rust Control. $8\frac{1}{2}\%$ of the total time was devoted to fighting seven fires.

From Table 39 certain observations may be made.

- 1. A relatively high percent of time, 14.44, was spent in training the men. This was due to the fact that this work was entirely new to all of the reconnaissance men. In order to obtain the right perspective, it was necessary for them to work in eradication crews for several days, in addition to the regular reconnaissance training. At the end of the training period, the men consecutively ran the same reconnaissance strip. The results were compared and talked over, with the purpose of establishing the same standards of judgement in taking data. On the first of August, the idea of eradication types was evolved. The reconnaissance men worked in the eradication crews for a few days on the different eradication types in order to become familiar with such types. In future work it is probably certain that it will not be necessary to devote so much time to training men, since there will be more trained men available.
- 2. 68% of the total reconnaissance time showed actual results. The time spent in training is included because much of the data then taken were used.
- 3. Over 15% of the time was spent in travel, making camps, back packing supplies, etc. Camps had to be moved quite often in order to cut down time spent in walking to and from work. The men established 10 camps during the season. Camp making consisted in providing for camp

TABLE XXXIX

Analysis of Reconnaissance Time Spent on Area No. 1 and 2, Friest Lake Timber Protective Association, June 16, 1924 to

		44.36	1 ,05 7	eometide	d
29287	: Percen	Days	Man	*	Type of Work
	0.54 :		225	9	Reconncissance Strips
	3.9 :		&SE	9 8	Traverse
	TT TI :		53	*	Mapping
	म् मा :		153	*	Preining
0*89		355		1	Total Actual Work
15.1	: 15.1	72	79	cking:	Travel, Camp Making, Pa
	I.d :		SE		Hain, no work
The last research is the last	: 10,8		56%	9	Sundays, Holidays
5.91	3	588			Total, No Work
OCI	: 100.	\$235	5833		Grand Total

Of the total 5233 men days spent on reconnaissance on the Priest Lake Timber Protective Association, 193 men days were furnished by the Association, and 3303 men days by the Office of Blister Rust Control.

In addition to the 563% days and not included in it, is an item of 48% days spent in fighting fires, paid for by the Forest Sevice, excent 2% days of Supervisor's time paid for by the Office of Flister Rust Control. 3% of the total time was devoted to fighting seven fires.

From Teble 39 certain observations may be mode.

- 1. A relatively high percent of time, 14,4%, was spent in training the men. This was due to the fact that this work was ontirely new to all of the reconsistence non. In order to obtain the right perspective, it was necessary for them to work in eradication crews for several days, in addition to the regular reconneissance training. At the end of the training period, the men consecutively ran the same reconnaissance strip. The results were compared and talked over, with the purpose of establishing the same standards of judgement in taking data. On the first of August, the idea of cradication types was evolved. The reconneissance men worked in the eradication orews for a few days on the different eradication types in order to become familiar with such types. In future work it is probably certain that it will not be necessary to devote so much time to training men, since there will be more trained men realiable.
- 2. 68% of the total reconnaissance time showed actual regults. The time spent in training is included because much of the data then taken were used.
- 3. Over 15% of the time was spent in travel, making camps, back packing sumplies, etc. Camps had to be moved quite often in order to cut down time spent in welking to and from work. The men established 10 camps during the season. Comp making consisted in providing for camp

sanitation, as approved by the Forest Service, in the construction of suitable latrines, and burying all tin cans and camp refuse. Considerable time was spent in bringing in supplies by back packing to camps not reached by horse trails.

V Costs of Reconnaissance

Table No. 40 gives the salary subsistence and transportation costs of the men working on Areas No. 1 and No. 2 discussed in this paper. No costs are given here of the two men doing educational and reconnaissance work on other portions of the Priest Lake Timber Protective Association. Such costs are given an page 159 Results of Summer's Work on Priest Lake Timber Protective Association.

TABLE XL

Costs of Reconnaissance Men Working on Areas No. 1 and No. 2, Priest Lake
Timber Protective Association

			7.4	mi oct	110000	OLVO A	SPOC TO OT	011		
Paid by	: N	0.:		: N	ionthly:1	No. of:	rotal:	Subsis-:	Trans-	:Total
Whom	: M	en:Po	sition	1 :5	Salary :	leys :	Salary:	tence :	portation	:Expense
Priest	*	1:He	lper	•	\$70.:	\$ 54:	126.00:	\$ 49,43:	900 pers 911	:\$175,43
Lake	: 1	1:	10		70.:	: 89:	207.67:	70.51:	9 years benigness	: 278,18
Timber	:	1:	11		70.:					: 238,58
Protectiv	e:	1:	11		70.:	5:	11.67:	8,61:	9000 min - 1000	: 20,28
Ass'n.	•	1::	11	;	70.:	5:	11.67:	8,61:	SAMPLE SECTION	: 20,28
Total		5:			:	228:	532,01:	200.74:		: 732.75
U. S.	: a	.1:Su	pervis	or:	225.:	50:	370.00:	48.82:	8,85	: 427.67
Office of	:	1:Re	corder		125.:	89:	370.83:	87.21:	9.80	: 467.84
Blister	:	1:	10	:	110.:	16:	58.67:	15.66:	1.00	: 75-33
Rust	:	1;	11_		80,:	88:	234.67:	89.30:	9.80	: 333.77
Control	15	1:	11		80.:	90:	240.00:	96.11:	5,90	: 342.01
Total .	:	5:	100		:	b. 333:	1274,17:	337.10:	35.35	:1646.62
Grand Tot	al	10:	21 1	9	:	561:	1806.18:	537.84:	35.35	:2379.37

a.--Represents half of Supervisors time. Remainder charged to reconnaissance on federal lands.

b.—Total includes $2\frac{1}{2}$ days of Supervisor's time spent in fighting fires and paid for by the Office of Blister Rust Control.

Subsistence costs are based on the following costs per man day:

Cost per day, cook furnished-\$1.23

Cost per day, without cooking charge-.97

The subsistence cost includes the actual cost of the food, and the transportation charges for delivering it to the camps on horse trails.

Transportation costs of men are those necessary to get the men to and from Spokane,

Table 41 shows the total costs.

sanitation, as approved by the Borest Service, in the construction of suitable latrines, and burying all tin cens end carp refuse. Considerable time was spent in bringingin supplies by back packing to camps not reached by horse trails.

V Costs of Reconneissance

Table No. 40 gives the salary subsistence and transportation costs of the men working on Areas No. 1 and No. 2 discussed in this paper. No costs are given here of the two men doing educational and reconnaissance work on other portions of the Priest Lake Timber Protective Association.

Such costs are given on page 159 Results of Sunmer's Work on Priest Lake Timber Protective Association."

TAPELS XT.

Costs of Reconsissance Men Cormins on Areas No. 1 and No. 2, Priest Lake

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: 278,18		70.51:	:19.703	: 65:	70.	25	: [Lake :
: 238.58	- Pale William House	63.5.3:	175.00:	:01	70.:	7 11 :	1:	: redmiT
: 20.28	Think Transitions	8.61:	11.67:	: 5:	70.:	p (1)	: [Protective:
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78.75# :	8,85	:88.84	370.00:	:07	: . 299	Supervisor:	I.8	U. S. :
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:1046.62	35.35	337.10:	1274.17:	b. 333:		8 9	5	Total:
78.8785:	35.35	537.84:	1306.18:	561:		b 4	10:	Grand Total

a. -- Represents half of Supervisors time. Remainder charged to reconnaissance on federal lands.

b. - Potal includes 2 days of Supervisor's time spent in fighting fires and paid for by the Office of Plister Rust Control.

Subsistence costs are based on the folloring costs per man day: Cost per day, cook furnished \$1.23
Cost per day, without cooking charge ... 97

The subsistence cost includes the actual cost of the food, and the transportation charges for delivering it to the camps on horse trails.

Transportation costs of men are those necessary to get the men to and from Spokane.

Table 41 shows the total costs.

TABLE XLI
Total Costs of Reconnaissance on Areas No. 1 and No. 2, Priest Lake Timber
Protective Association.

Items	*						
	:By	Association	:By (office of B.R.C		Total	
Salaries	:	532.01	•	1274.17	:	1806.18	
Subsistence	:	200.74	:	337.10	:	537.84	
Transportation	•		:	35-35	:	35,35	
20% of Property	7:		9	27.56	9	27.56	
Total	:	732.75	:	1674.18	:	2406.93	

Property consisted of non-expendable supplies, such as scientific instruments, bedding, tent, etc., used by reconnaissance men working on these two areas in the Association. 20% of the total value was charged against the work done this year.

Cost per acre—2406.93—,118 per acre
20332 Acres

E(2.3) Chemical Eradication of Ribes

Introduction

This report covers the experimental work on the eradication of Grossulariaceae in the white pine forests of Idaho during the season of 1924.

This particular problem is one phase of the general experimental program on eradication of Grossulariaceae (hereafter referred to as Ribes). The general purpose of such work is to secure the control of white pine blister rust, by removal of its Ribes hosts, and hence to protect the white pine timber on the ground.

It is recognized that the general method of Ribes removal will be by hand pulling. It has been found, however, that in certain areaswithin the white pine type, Ribes occur in such profusion as to render hand pulling impracticable, when the cost of such work is balanced against the value of the white pine endangered by the presence of these Ribes. Also, other local growth, moisture, or topographical conditions may similarly increase the cost of hand pulling, irrespective of the actual number of plants. Experimental chemical eradication has been carried on to determine if the Ribes on such areas can be eradicated by the application of chemicals at a cost less than that of hand pulling.

In considering possible chemicals the following general properties have been recognized as necessary to the ultimate success of such work.

l. The chemical should be so cheap that the combined cost of the chemical and its application to Ribes will be less than any other means of eradication.

TARELE XLI

Total Costs of Reconnairsance on Areas No. 1 and No. 2, Priest Lake Mimber

	to the same and an arrange	BAN AALA DAA OLT	11.6100	a UU.	and the second s
Items	*		7)	osts	
	: By As	Association	:By	Office of B.R.C.:	TotoT
Salaries	*	532.01	:	: 71,+1751	1806.18
Subsistence	*	47.00S	:	337.10 :	537.84
Transportation	* 1		:	35.35	35.35
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In considering possible chamicals the following general propertiches been recognized as necessary to the ultimate success of such work.

1. The chemical should be so cheap that the combined cost of the chemical and its application to Piber will be less than any other menes of eradication.

- 2. It must be available in large enough quantites to be used in extensive eradication in the white pine forests which are to be protected from the blister, rust.
- 3. It should be capable of transportation into the forests. Very often transportation facilities are very meager and supplies must be carried long distances by pack horse or on back. Under such conditions heavy or dangerous substances would not be transportable.
- 4. It should be comparatively non-texic to animals. A toxic substance may be applied to the surface of the soil or injected into the soil at the roots of the plant without much danger to livestock or protected animals. If such a substance were to be applied as a spray to the leaf surface, all animals would be endangered and if running water were present the pollution of streams would result.
- 5. It should be capable of being easily applied to Ribes. Toxic substances or substances which require skill and training to apply would increase the cost of eradication in that ordinary labor could not be employed.
- 6. It should cause the death of Ribes with a single application, There are many substances which will cause defoliation of the plants but unless repeated applications are made the plant will regain its foliage or will sprout up with new stems from the crown.

PREVIOUS WORK DONE WITH CHEMICALS

The chemicals used in the experimental work this summer were suggested from various sources. Some were chosen because of personal observations or a knowledge of their chemical properties. All available literature which might suggest possible poisons was carefully read over and all practical suggestions were tried.

Much help was obtained from the work on weed eradication and wheat rust control.

- W. G. Wahlenberg of the Savenac Nursery tried copper sulfate, zinc chloride and zinc sulfate for killing weeds in nursery stock. Zinc chloride was finally adapted for this use and has been giving very good results.
- W. S. Regan assisted by others of the U.S.D.A. has tried a large number of chemicals on Ribes but does not seem to have decided on anything, which is perfectly desirable for the purpose of eradication. He tried the following substances: steam, phenol, iron sulfate, copper sulfate, sodium nitrate, copper nitrate, mercuric chloride, formalin, carbon bisulfide, sodium arsenite, sodium chloride, sulfuric, hydrochloric and nitric acids, ammonia, fuel and dip oils and calcium and hydrogen cyanide. From these investigations Regan recommended sodium arsentte and fuel oils to give the best results but they do not seem to have been used extensively in practice.

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W. S. Regan also made an investigation on the use of chemicals for destroying barberry plants. The chemicals used were: Dipoil (25% cresol), fuel oil and sodium arsenite. The chemicals were applied to the foliage, foliage and base, base with tops on and to the cut-off stumps. The applications to the plants with tops cut off gave the best results but the applications to the base of the plant with tops on was considered the most efficient. The fuel oil was found to be the most economical and efficient. In the case of barberry plants Regan concludes that the chemical method offers a saving in time, labor, and expense over the hand digging method.

Very little work has been done in this line of investigation and not much material is available in literature on the subject of toxic agents. The following is a brief summary of articles which have appeared in various journals:

In "Inorganic Plant Poisons", W. E. Brenchley, discusses the effect of calcium, magnesium, manganese and copper compounds on herbaceous plants.

Sodium selenide and other compounds of selenium have been found to be very toxic to plants (Bot. Abs. 13-458).

Some substances which were toxic to plants in light produced no effect in the dark. Solutions of cyanides which produce permanent injury in light did not produce injury when plant was kept in the dark. (J Phsy. Ch. 5-108).

The nitrated phenols were found to be more toxic to plants than ordinary phenol and para-nitro phenol is more toxic than either ortho or meta-nitro phenol. Isomeric compounds have different effects on plant tissues (J. Phys. Ch. 7-1105).

Hydroquinone was found to be very toxic to herbaceous plants (Pharm. J. 91-571).

Sulfur dioxide fumes are toxic to plant life. The toxicity is explained by assuming the liberation of humic acid from its salts with the consequent dearrangement in nutrition (Chem. and Met. 7-285).

Hydrogen cyanide is very toxic to plants. 1 part in 10000000 kills peas. The HCN is unstable and hydrolyses to ammonium formate in the presence of moisture. Formic acid is toxic only in concentrated solution. 1/100 Molar phenol, cresol, pyrocatechol and pyrogallol is fatal to peas grown in nutrient solution. Dilute solutions, 1/500 Molar, of phenol, phyloroglucin, orcinol, and resorcinol only check the growth of peas. (Ann of Bot. 31-456).

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Investigations have been made of possible injurious effects on plants of KCN in discharge slimes from mines. Water in river at the mine contained .05% of KCN. Two kilometers down stream it was .04% and at 4 kilometers it was diluted .025% (Ch. & Met. Eng. 9-588).

Poison absorbed through the roots of plants involves the use of large amounts of the poison as it must produce a toxic condition in the soil and also stop the functioning of the plant. The amount of poison may also be increased by changes brought about by the soil which may render the poison inert. The toxic condition may be transitory or permanent depending on the volatility and solubility of the poison and its affinity for the soil elements and the quality of the soil and drainage conditions. Poisons absorbed through leaves of plants requires a minimum amount of poison and does not involve poisoning of the soil and is more efficient than the root absorbtion method. Poisons suggested for eradication are arsenic compounds, copper sulfate, iron sulfate, sulfuric acid, sodium chloride, carbon bisulfide, petroleum and coal tar oils. (Herbicides in the eradication of weeds, Calif, D.A.Bul, Feb. 1922).

CHEMICALS USED

A review of the literature given in the introduction suggested a large number of substances which might have been tried in this experimental work. It was necessary however, to discard most of them because of the price which made them prohibitive to use on a large scale. The following chemicals appeared to have possibilities for chemical eradication:

Chemical 1. Potassium permanganate	Formula KMnOn	Price per 1b.	
2. Oxalic acid	(COOH)2	2 5	
3. Manganese sulfate	MnSO ₄	≈ 80	
4. Magnesium sulfate	MgSO ₄	. ,2 6	
5. Zinc sulfate	ZnSO _{lj}	*37	
6. Iron sulfate	Fe ₂ (SO ₄) ₃	e., • 20	
7. Sodium acid sulfate	NaHSO4	.03	
8. Calcium chloride	CaCl2	, 20	
9. Calcium hypochloride	Ca(OCL)2	.15	
10. Calcium oxide	CaO	.02	

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Chemical Potassium permanganate	Formula KWnOu	Price per 1b.
2. Oxalic acid	(COOH)2	285
3. Mangenese sulfate	Masou	02.
4. Magnesium sulfste	Meson	35.
5, Zinc sulfate	Znsou	~ ~ ~
6. Iron sulfate	Feg(SOH) 3	05.
7. Sodiwa soid sulfate	HOSHBN	£0.
8. Calcium chloride	CaCl2	OS.
9. Calcium hypochloride	Ca(00L)2	21.
10.Calcium oxide	CaO	SØ.

Chemical (Con'f)	Formula (Con't)	Price per 1b. (Con't)
11. Calcium cyanide	Ca(CN)2	. 30
12. Carbon bisulfide	cs ²	. 60
13. Copper sulfate	CuSØ ₄	. 09
14. Copper carbonate	CuCO ₃	• 35
15. Mercuric chloride	HgCl2	. 90
16. Lead acetate	Pb(C2H3O5)5	. 85
17. Potassium bromate	KBro3	-75
18. Potassium ferrocyanide	K ₄ Fe (CM)6	*95
19. Potassium cyanide	KCN	₹75
20. Chromic Acid	H ₂ CrO ₄	•80
21. Tennic acid	c ₁₄ H ₁₀ 0 ₉	1,25
22. Phenol	с6н2он	3 5
23. Paris green	(Cu(C ₂ H ₃ O ₂) ₂	, 80
24. Creosote	Crude_	75
25. "Carco"	Commercial	" 90

Sodium nitrate is a well known plant food unless used in excessively large quantities which make it impractical to use in this work. Copper nitrate was replaced by copper sulfate because the sulfate radical is more toxic than the nitrate. Sodium chloride, sodium arsenite and sulfuric, nitric and hydrochloric acids and ammonia, fuel oil, dipoil, and hydrogen cyanide were sufficiently investigated by Regan to show their impractibility.

Potassium permanganate, potassium bromate, and oxalic acid were used because it was thought that strong oxidizing agents would have a strong action on the plant tissues but this was not shown to be the case in the experiments. Manganese and magnesium sulfates were suggested by Dr. St. John of Pullman but were found to be without effect. Mercuric chloride, lead acetate, tannic acid and chromic acid were used because of their power to combine with proteins to render them inert. This was augmented by experiments

Price per lh. (Con't)	Formula (Con't)	Chemical (Corif)
0.5 a.	Ca(CN) ₂	11. Calcium cyanide
ce.	s ⁸⁰	12. Carbon bisulfide
60.	ti o eno	13. Copper sulfate
-75	C0003	14. Copper carbonate
06.	Hgol ₂	15. Mercuric chloride
.85	Fb(C2H3C2)2	16, Lezd aretate
27-	K3r03	17. Potassium bromate
-95	Z ₁ Te (CH)	18. Potessium ferrocyanide
*75	KOM	19. Potessium cycnide
.80	HOJOSH	20. Chromic Acid
1,25	°14 [£] 10 ⁰ 9	21. Tennic acid
* 35	GS-POF	22. Phenol
O∑ *	(Cu ₂ (NsO ₂) ₂)	23. Peris green
CT.	Crude	24. Creosote
OC	Connercial	25. "Carco"

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and it is proposed to investigate this property to a greater extent.

"Carco", a commercial spray was recommended by the Spokane Seed Co., and was
found to have a slight burning power but did not kill the plants.

Paris green was used because it had been observed to burn the leaves of potato plants when applied for potato bugs. It was found to be without effect as would probably be expected from the small amount of soluble arsenic contained.

Calcium hypochloride (Bleaching powder) was used for its available chlorine. It was found particularly distructive to the foliage although it is not certain that the plants were killed. Crossote was known to burn leaves and it was found to have very little effect other than burning of the foliage.

TYPES OF CONDITIONS OF RIBES GROWTH

The situations in which the Ribes grow may be used as a basis for their classification. Dividing the eradication problem into different types on this basis the classification may be considered somewhat as follows:

- l. R. petiolare or R. lacustre growing directly in water or over it on decaying logs to make a dense patch which effectually hides a stream from view. The roots often grow directly in running water thus making spraying the only possible method of attack.
- 2. R. petiolare or R. lacustre in dense patches with no individual crowns but away from the stream in slightly moist places.
- 3. R. lacustre and G. inermis scattered through dense brush which may consist of Alnus, Crataegus, Cornus, Lonicera, Rhamnus and others.
 - 4. R. lacustre in talus or rocky outcrops.
- 5. R. lacustre in windfalls and slashings.
- 6. R. viscossissimum in large separate plants near stumps and windfalls.
 - 7. Ribes scattered throughout a district as individual plants.

METHODS OF APPLICATION

1. For regions in type one the only method of application is by

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 - 4. R. lecustre in talus or rocky outcrops.
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METHOL'S OF APPLICATION

1. For regions in type one the only method of application is by

spraying the entire leaf surface and stems. In the experiments during the summer this method was found to be the best for all conditions as it was simple, efficient and gave the best results.

- 2. Applications at the surface of the soil around the crown of the plant. This was done by squirting the liquid at the base of the plant and was only applicable to plants in a fairly dry location. Good results were obtained but it was not as efficient as spraying.
- 3. Injection in holes at crown of the plant were made by thrusting a sharp pointed rod into the soil next to the crown of the plant and squirting the liquid directly in the hole produced upon withdrawal of the rod. This was the least efficient of the methods tried due to the fact that Ribes have a fairly shallow root system and in a sandy soil most of the solution would be lost in the subsoil.

These three methods were the only ones tried in this work. There are other methods which might be used but they were not tried because of lack of time. The bushes may be cut near the surface of the ground and the substance applied over the stumps. W. S. Regan found this to be a very effective method. In the case of dense patches of Ribes the substance may be broadcasted over the entire surface of the soil.

APPARATUS

The most practical method of carrying and disseminating the chemical when in solution or liquid form was found to be the Hudson Perfection Spray Outfit which sells at most feed stores for \$6.50. This is an ordinary five gallon cylindrical tank equipped with a pump and a strap to put over the shoulder for carrying. The tank may be filled about \$\frac{3}{2}\$ full and pumped up by a few strokes of the pump which will give sufficient pressure to eject all the liquid. The nozzle will give a fine spray which effectually covers the foliage or if a course stream is desired the nozzle is easily adapted by removing a small plate under the screw cap. All solutions were made up in definite concentrations by weighing out the chemical on a good spring balance and adding the required amount of water measured in a graduated cylinder.

LOCATION OF PLOTS

During the past summer numerous plots have been established in the field. Of the total number of plots 44 are located on Placer Creek six miles south of Wallace, Idaho. There are 10 plots on Lake Creek, four miles west of Wallace and 26 plots on the East River branch of Priest River in Northern Idaho about two miles from the Priest River Forest Experiment Station.

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ENTABLISHMENT OF PLOTS

The Ribes bushes on all plots established were tagged and numbered and the plot was staked in the center with a good cedar stake bearing the number of the plot.

DATA TAKEN ON PLOT

The data taken on each plot included: date of application, character of day, chemical used, method of application, quantity and concentration of solution, number Ribes, shrubs and trees present, character of site and the size, age, number of branches, and amount of leaf bearing stems and the vigor of the plant. (See sample data sheet.)

PLOTS ON PLACER CREEK

All plots on Placer Creek are located in respect to the spot where camp was made. The first camp was situated at the head of the road about two miles above the ranger station in a slight depression. The place is clear of logs and there is a path to the creek which is about 50 feet away. The second camp was located in a clump of large cedar trees about 300 yards below the ranger station and 50 feet from the road.

Ribes were found to be very abundant in the 1910 burn around Wallace. On placer Creek the reproduction is slowly coming in. The trees are between 5 and 10 years old and consists mostly of white pine, Douglas fir, spruce, larch, cedar and some white fir, hemlock, western yellow pine, and lodgepole pine. Throughout the district stumps and down timber are very numerous because of the 1910 burn. R. petiolare occurs mostly as dense patches in the stream bed or in very moist places along the stream. R. lacustre is found all along the stream in moist places and among the numerous windfalls and stumps all over the country even on the highest hills at an elevation of 5500 feet. R. viscossissimum is found generally scattered over the dryer hillsides from the valley bottoms up to about 4000 feet. In this locality plots of R.petiolare, R.lacustre and R. viscosissimum were treated with chemicals during the first part of August.

ESTABLISHMENT OF FLOTS

The Pibes bushes on all plots established were tagmed and numbered and the plot was started in the center with a good ceder stake bearing the number of the plot.

DATA TAKEN ON FLOT

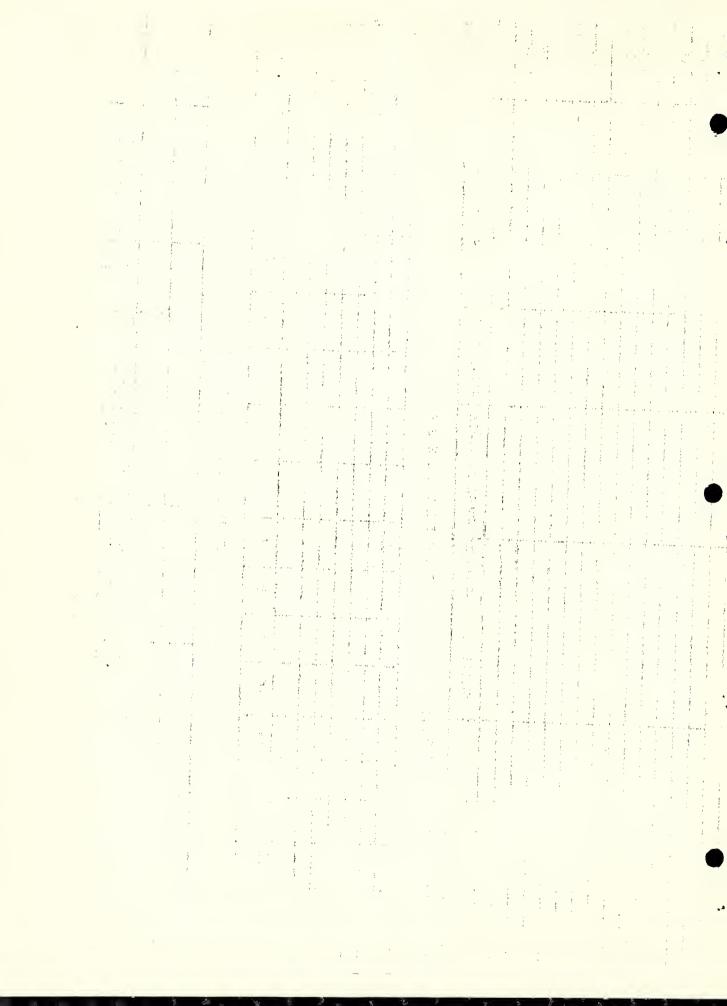
The deta taken on each plot included: date of application, character of ey, chanical used, method of application, quantity and concentration of solution, number Ribes, shrubs and trees present, character of site and the rise, age, number of branches, and amount of leaf bearing stems and the vigor of the plant. (See sample data sheet.)

FLOTS OF FLAGER CREEK

All plots on Placer Greek are located in respect to the spot where camp was rituated at the head of the road about two miles shove the ranger station in a slight depression. The place is clear of logs and there is a path to the creek which is about 50 feet away. The second came was located in a clump of large ceder trees about 500 yerds below the ranger station and 50 feet from the road.

Ribes were found to be very abundant in the 1910 burn around allace. On placer Creek the reproduction is slowly coming in. The trees are between 5 and 10 years old and consists mostly of white oirs. Douglas fir, spruce, larch, cedar and some white fir, hemlock, western yellow pine, and locaenale pine. Throughout the district atumps and down timber are very numerous because of the 1910 burn. R. actiolare occurs mostly as dense natches in the stream bed or in very moist places along the stream. E. Lacustro is found all along the stream in moist places and among the numerous wirdfalls and stumps all over the country even on the highest hills at an elevation of 5500 feet. R. viscosistium is found generally scattered over the dryer hillsides from the valley bottoms up to about 4000 feet. In this locality plots of R. petiolare, B. B. accustre and E. viscosistium were treated with chemicals during the first part of August.

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PLOTS ON LAKE CREEK

The plots on Lake Creek are located with respect to the number of telephone poles distant from the Callahan Interstate mine which is just upstream from the plots. The region in the immediate vicinity of these plots was not burned over in 1910 but has been logged off about 15 years ago so that there is very little mature timber around. The reproduction is of the same type as on Placer Creek except that it is a little older. In this locality applications were only made on R.petiolare and R.lacustre. The shrubs in these two regions are very similar and consist largely of Salix, Alnus, Carnus, Acer, Amelanchier, Crataegus, Symphoricarpos, Rubus, Sambucus, Deanothus, Lonicera and Pachystima.

PLOTS ON EAST RIVER

These plots are located along a private road on the East Fork of the East River about a mile East of the bridge on the main road to Priest Lake. The private road crosses the East Fork on a log bridge and the plots are located with respect to a small clearing to the left of the road and about 200 yards up from the bridge.

The timber on the East River is a mature growth consisting largely of Douglas fir, spruce, white pine, cedar, larch, and hemlock. The shrubs are nearly the same as those around Wallace except for a preponderance of Crataegus. In this region G. inermis occurs as single plants growing in the dense brush usually in a large Crataegus clump. This gooseberry is the only one which was treated with chemicals in this region. Thenever possible the chemicals were kept off the surrounding vegetation but in the case of G. inermis it was necessary to spray the entire clump in which the bush was found.

OPTIMUM SOIL REACTION FOR RIBES

The hydrogen ion concentration of the soil in which Ribes flourish was studied by means of a Lamotte portable soil indicator set. In most cases the soil reaction was found to be very nearly neutral except in the case of rich humas soils without very good drainage. In such cases the soil was usually very slightly acid. The result of a series of determinations to determine the optimum hydrogen ion concentration indicated the value to be very nearly 1 X 10-65, or a specific acidity of 3. A considerable change in the soil reaction does not seem to alter the vitality of Ribes as was indicated by the fact that when quite a large quantity of calcium hydroxide was applied to the soil there was no change in the vigor of the plant even after two months had elapsed although the soil reaction was changed from 1 X 10-6 to 1 X 10-9.

PLOTS ON LAK CHARK

The plots on lake Creek are located its nearest to the number of telephone poles distant from the Callahan Interstate mine which is just upstream from the plots. The region in the immediate vicinity of these plots was not burned over in 1910 but the been logged off about 19 years are so that there is very little arture timber eround. The reproduction is of the same type as on Flacer breek except that it is a little older. In this locality appliestions are only made or E. petiolare and E. lacustre. The shrubs in these two regions are very similar and consist largely of talix, Aluus, Carnus, Acer, Amelanchier, Cratacgus, Symphoricarpos, Bubus, Carnus, Ecanothus, Locicera and Fachystims.

PLOTS OF TAST BIVER

These plots are located glong a private road on the East Fork of the East Liver shout I mile get of the bridge on the mein road to Friest Lake. The private road crosses the Dant Fork on a log bridge and the plots are located with respect to a small elegible to the left of the road and about 200 years up from the bridge.

The timber on the Fest River is a meture growth consisting largely of Douglas fir, spruce, white pine, ceder, larch, and hemlock. The skrubs are nearly the same a those round wallace except for a preponderance of Orstregus. In this region C. inemis occurs as sin leplants growing in the dance brush usually in a large Orstregus clumn. This gooseberry is the only one which was treated with chemicals to this region. Thenever possible the chemicals for the vegetation but in the case of 1. inermis it was necessary to sorey the entire clump in which the bush was found.

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It was observed that the vegetation along the streams and stream banks around Wallace, Idaho had been completely killed. The mines in the vicinity discharge all their refuse into the streams and it was thought that a knowledge of the cause of death of the vegetation might be of practical importance. The water in the streams is heavily laden with sediment and is a gray chalky color. In a discussion with the chemist at the Hercules Mine it was learned that very little poisonous material was discharged from the mines. It seemed evident that the cause of death was due not so much to poisonous compounds but rather to the fact that very finely divided ore of almost colloidal size was deposited around the roots and compacted to such an extent that the oxygen, which is so necessary for growth, was excluded with the eventual death of the plant. The sediment in the streams contains iron, lead, copper, and zinc in the form of carbonates, sulfides, sulfates, nitrates and oxides. There is also some creosote and flotation oils and free sulfuric acid.

, SUMMARY OF RESULTS

No final conclusions can be made in regard to the effect of the chemicals on the Ribes until next spring after dormancy, due to the fact that although the plants may have been defoliated they may renew their activities in the spring. From the observations so far made the following chemicals have shown at least considerable defoliating properties: Calcium chloride, Phenol, calcium hypochloride, mercuric chloride, copper sulfate, potassium bromate, chromic acid, creosote, calcium cyanide, potassium cyanide and potassium ferrocyanide. The results seem to indicate that these substances should be further investigated in future work. Of these chemicals, chromic acid, mercuric chloride, calcium hypochloride and phenol produced more complete defoliation and a higher percentage of killing than the others. These last four were particularly effective when applied as sprays. The soil application were at no time as effective as sprays. This is very desirable as in actual field work a spray is often the only possible method of application. Of the four species of Ribes to which applications were made there was no single species which was particularly resistant to the chemicals. There was also no noticeable difference in the results obtained by a single chemical in different localities. In the case of calcium chloride, phenol, mercuric chloride and calcium cyanide the results are practically the same as those obtained by W. S. Regan in his work in New England. W. G. Wahlenberg has remarkable good results with zinc sulfate on weed seeds and very succulent growths but on more fibrous tissues the chemical is found to be very weak.

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F(2.4) ECOLOGY

The purpose of this study is to secure information which would be of direct and practical value in protecting white pine from blister rust.

It has been commonly observed that Ribes are generally less numerous in mature stands of timber than in young stands. In view of this observation the ecological study was undertaken to determine the following facts:

- 1. The reason for the above phenomenon.
- 2. Is there a definite decrease in the number of Ribes after a definite point in the life history of a timber stand?
 - 3. If so what is that point?

4. If the Ribes were removed at or after that point would they reinvade the forest?

In the summer of 1924 this work was directed toward the determination of the time at which suppression of Ribes in coniferous reproduction would occur with the increase of shade and presumably from that as a cause. Studies made were in "turns" of varying ages. It was thought that by comparison of conditions found in comparable areas of differing ages an approximation could be made of the age class in which local control measures would be unnecessary.

Obvious difficulties in securing needed information led to the adoption of a plan of "sampling" by laying off zigzag strips one half rod in width and twenty-four chains in length in selected burns. Strips were laid off with compass, with angles of 90° alternately to left and right at the ends of the third, ninth, fifteenth and twenty-first chains. The object of this type of strip was to eliminate in so far as possible unconscious choice of any particular type of vegetation, making the strip as nearly "at random" as could well be done.

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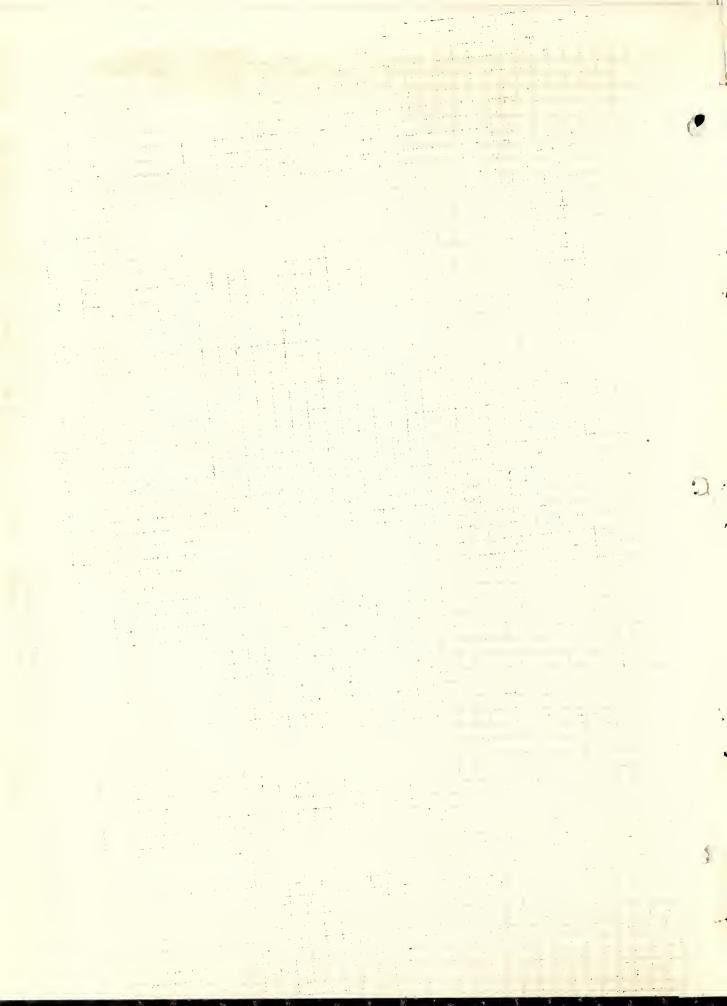
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Complete "census" of all plants within the "transects" so limited was taken in the following manner:

With a working party of two or three a steel tape one chain in length was extended in a straight line in a direction determined by use of a Forest Service Compass. Conspicuous temporary marks were placed along the tape to mark each rod. Plants were then counted for each plot of $l \times \frac{1}{2}$ rod and the names and numbers of the different species occurring recorded on a tally sheet. Separate records were thus kept for each rod of length. Space was provided on the tally sheets for records of otherpertinent facts relating to slope, soil, light and moisture for each rod. It was felt that by such records subdivided into rods it would be possible to focus upon any peculiarity of plant group closely enough for any purpose of study that might arise.

The accompanying form was used for recording data of the Plant Census.

Ten of the zigzag strips were begun. One of these was not completed as it was found that it would not pass through coniferous reproduction. A detailed map was made of an area one chain square in a five year old burn, on which was shown the location of all Ribes and conifers. This was marked with sufficient permanency that future studies covering the exact area may be made. The detail of this plot study is such that it will be possible to check individual pine and Ribes plants from year to year and to check the coniferous population on all subareas of one fourth of a square rod.

A transect comparable with the zigzag strips was made of the Hughes Fork Trail from the beginning of the steep portion near the Priest River crossing to the North line of Section 22 T. 64 N. R. 5W., a distance of nineteen hundred and ninety-two (1992) feet. Parallel to this, in the dense forest at a distance of twenty feet, a check strip was run and the census taken on it. The study of this trail and the parallel was for the purpose of getting data concerning the entry of plants in such openings in the forest.

Before leaving a strip it was permanently marked at the point of geginning with conspicous cedar posts. Accuracy of notes are relied on to make possible a repetition of the work on any strip should such be desireable.

The map accompanying this general report will give the approximate location of the above mentioned areas.

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TABLE XLII

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As yet little of the data collected from these studies have been utilized in summaries. It seems probable that much may not be of a character to throw light on problems for which solution is sought. On the other hand such as has been utilized seems to indicate that other ecological factors which have not yet been included should be considered. An increased number of similar areas must be studied before conclusions other than the most tentative in character may be drawn.

Indicated by the materials considered are the following:

I .- Concerning Ribes lacustre the following hints are derived:

- A. R. lacustre enters a burn early, within the first two years, reaches the maximum number of plants between the eighth and tenth years, the maximum leafage about the 10th year to 15th year and the maximum feet of live stem in about the 10th year. The maximum of dead stem appears to coincide with the maximum of live stem. More extensive investigations may change this.
- B. Notable diminution of the number of plants of R. <u>lacustre</u> begins very shortly after the maximum number is reached, and decreases to a minmum about the fortieth year.
- C. In plotting data collected a considerable "spread" or "dispersion" is indicated in the numbers of R. lacustre within the same age classes on different areas. This was doubtless due to lack of real similarity of situations. Ecological factors not yet recognized are perhaps the cause. This "spread" is not unexpected but should be reduced as new factors are recognized as occasioning re-grouping of areas studied.

II.-Ribes viscosissimum, in the areas studied occurred less frequently than \underline{R} . Lacustre. It enters the burned areas later than \underline{R} . Lacustre and its increase is slower. Data collected do not warrant even tentative statements as to time of maximum or decrease. It appears more frequently in dry situations than \underline{R} . Lacustre. It shows a peculiar tenacity in deep shade, frequently growing with a tuft of two or three leaves at the end of a single stem many feet in length, a habit not observed in \underline{R} . Lacustre.

The most positive and perhaps most important conclusion possible is that a species must be considered as a separate ecological entity and there can be no ecology of the genus Ribes but instead each species must be dealt with separately.

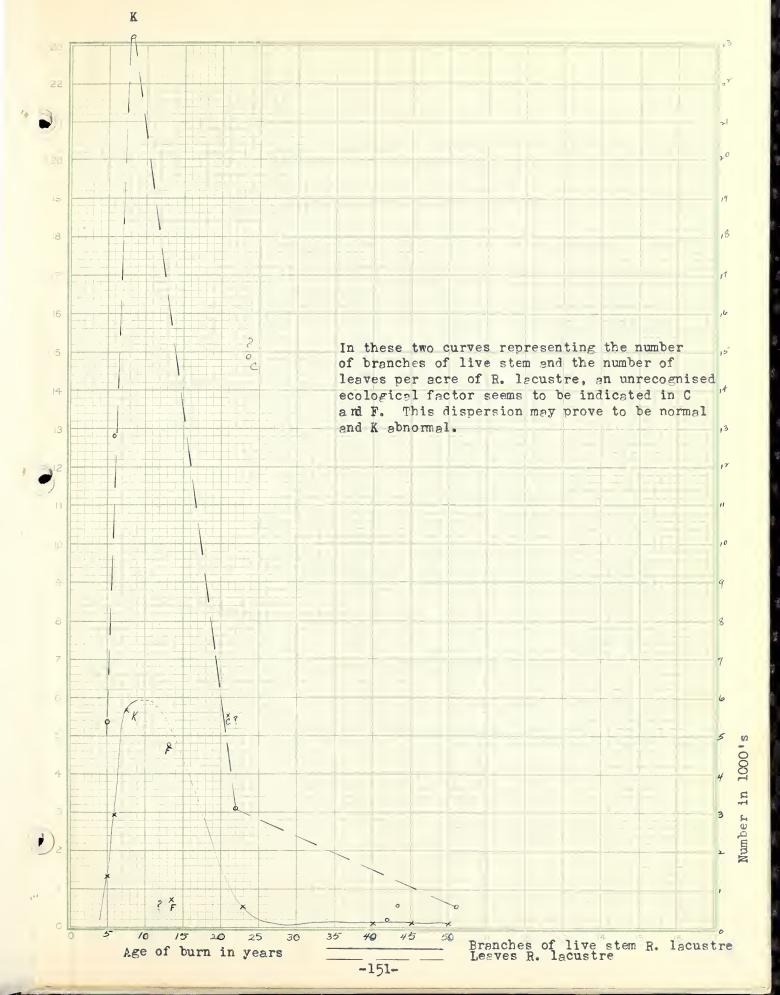
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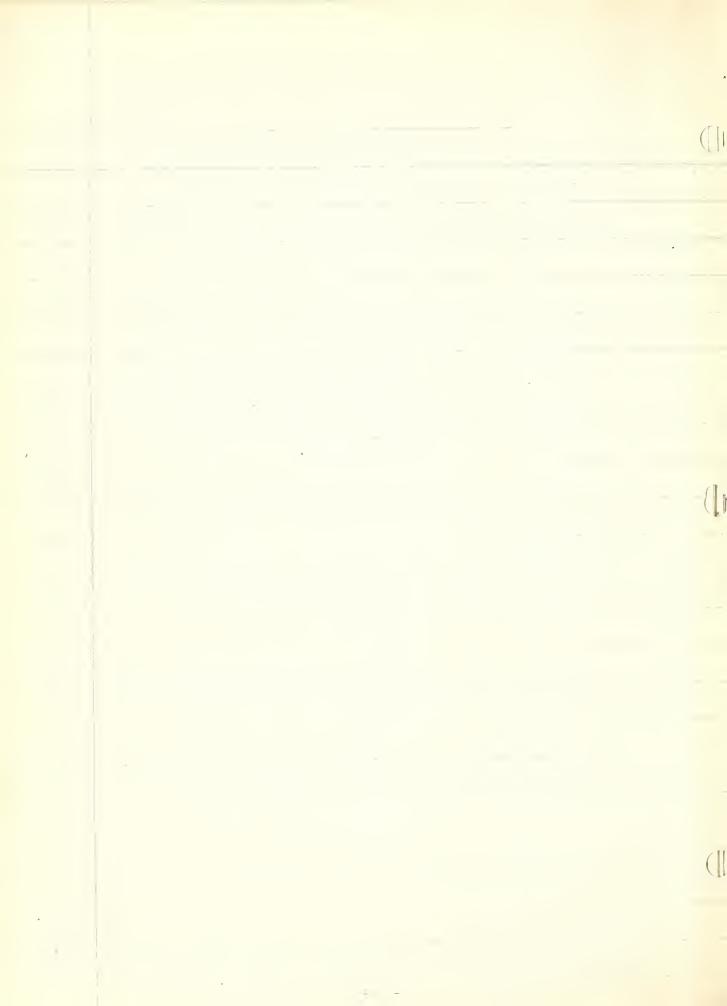
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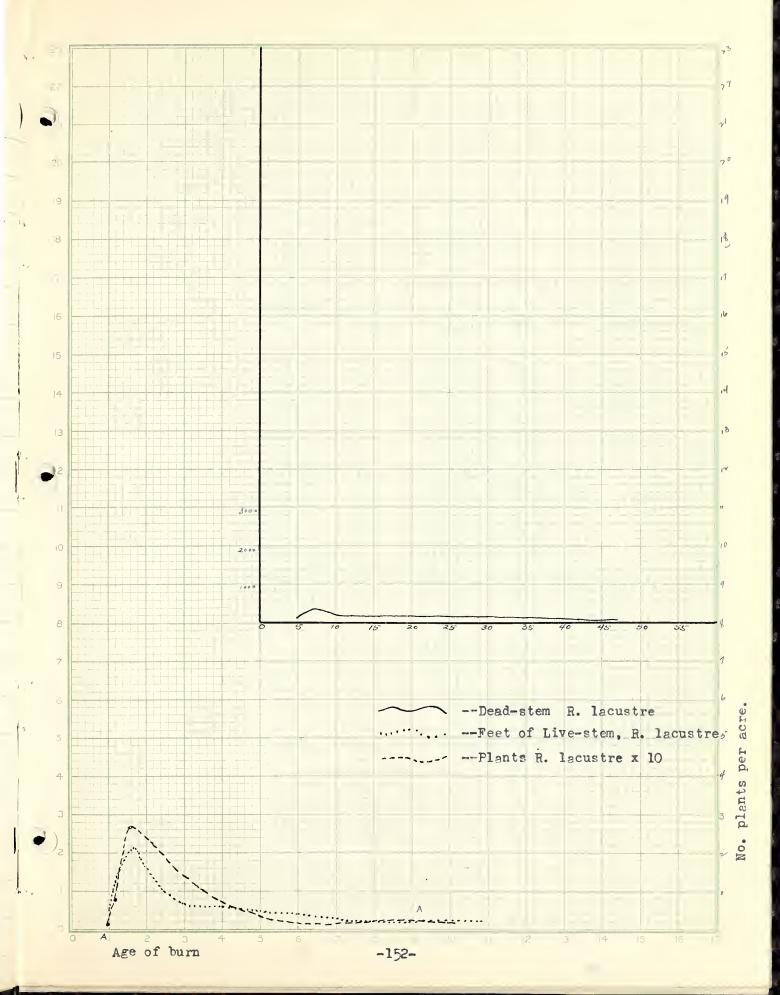
I .- Concerning Ribes Lecustre the following hints are derived:

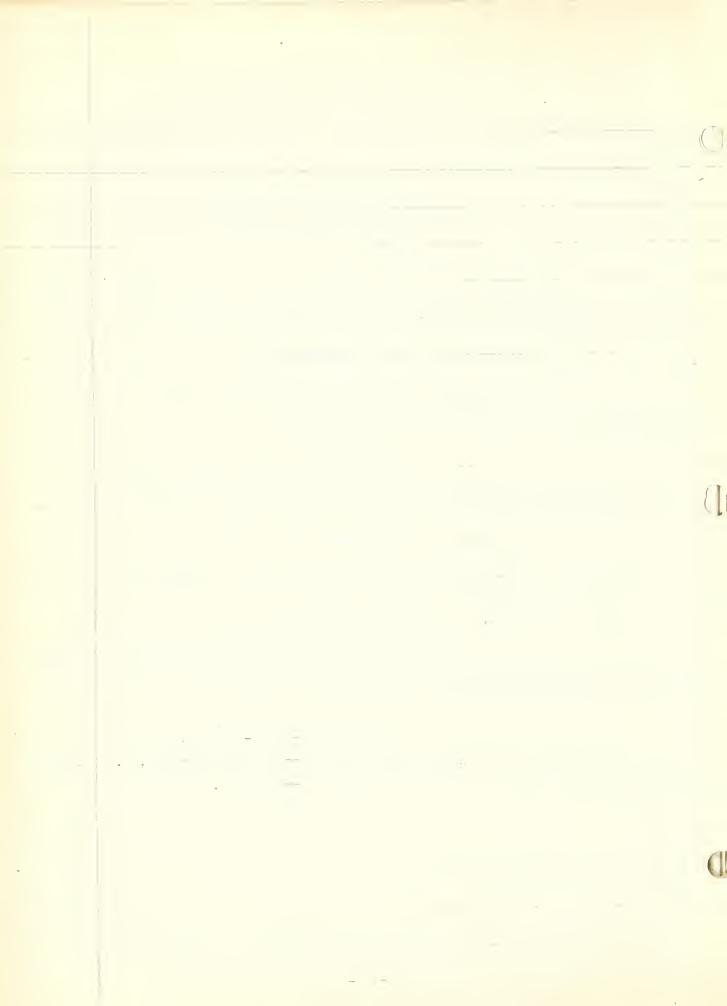
- A. E. lecustre enters a burn early, within the first two years, reaches the maximum number of plants between the eighth and tenth years, the maximum leafage about the 10th year to 15th year and the maximum feet of live atem in about the 10th year. The maximum of dead stem appears to coincide with the maximum of live atem. More extensive investigations may change this.
- B. Notable diminution of the number of plants of R. lacustre begin very shortly after the maximum number is reached, and decreases to a minmum about the fortleth year.
 - C. In plotting deta collected a considerable "spread" or "dispersion" is indicated in the numbers of R. Lecustre within the same age classes on different areas. This was doubtless due to lack of real similarity of situations. Reological factors not yet recognized ore perhaps the cause. This "spread" is not unexpected but should be reduced as new factors are recognized as occasioning regrouping of areas studied.
 - II.—Tibes viscosissinum, in the cress staticd occurred less frequently then I. lecurite. It enters the burned areas leter than E. lecustre and its increase is slower. Tota collected do not warrent even tentative statements as to time of maximum or decrease. It spoeses more frequently in dry situations then E. lecustre. It shows a deculiar tenacity in deep alade, frequently growing with a tuft of two or three leaves at the end of a single stem many feet in length, a habit not observed in E. lecustre.

The most positive and perhaps most important conclusion possible is that a species must be considered as a separate ecological entity and there can be no ecology of the genus Ribes but instead each species must be dealt with separately.









REPORT ON COOPERATIVE BLISTER RUST CONTROL WORK BETWEEN MESTERN
Office of White Pine Blister Rust Control and Inland Empire
Protective Associations.

* * * * * * * *

In view of the fact that the White Pine Blister Rust is rapidly approaching the white pine stands of the Inlden Empire it was deemed desirable that definite steps be taken to start some field work in the different timber protective associations with the ultimate object of protecting their stands of timber from this disease.

During the past summer season a two man crew has been carrying on a similar project in each of the associations. For this work one man was provided by each association and one man from the Office of Blister Rust Control.

The objects to be attained were three-fold, first that of an educational nature; second to scout for the disease, and third reconnaissance studies. The educational work consisted in interviewing all members of the association at their stations, and by the display of specimens of the disease and discussion make them as familiar with the disease as possible; further to call their attention to the native Ribes of their region so that they would recognize them. It was expected by this method to make potential scouts of the employees of the association so that in the course of their work they could scout for the disease.

The reconnaissance work in the association consisted in running strip lines over different areas to determine the different kinds of wild currents and gooseberries that occurred on the area, their relative abundance, as well as some data on other factors such as brush, windfall, topography etc., which have a bearing upon the eradication problem.

Training of Personnel

All of the men employed upon this work were temporary men who were unfamiliar with blister rust work. In order to prepare these men for their summer's work a school was conducted in the woods about 12 miles north of Upper Priest Lake, from June 18 to 30. During this period all phases of the present known information regarding blister rust were gone over thoroughly. Further, the men were required to work a few days on eradication crews and reconnaissance crews under close supervision so that they would know exactly how the control work was accomplished. In the reconnaissance training they were asked to do the same work, then their results were compared. By this latter means a uniform basis for judging different conditions was established.

The following tables give a summary of the summer's work in all of the associations in northern Idaho:

REFORT COCCERNIVE BLAST CONTRACTOR EK E TANK BESTTEN Office of thite Fine Elister Rest Control and Inland Empire Protectiv. (sensistions.

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In view of the fact that the fair Blister Past is rapidly suprosching the white cine stands of the Inland mairs it was fremed desirable that definite them in the different timber protective around the with the ultimate object of protecting the their stands of timber income the cines.

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TABLE XLI

CHARACTERISTICS OF EMPLOYEES OF ASSOCIATIONS

Total Coeur d'Alene: Clearwater Pend Oreille Priest Lake Association Name : Employees: Woodsmen : Experienced: Interested: Years 156 D u, ssy : Familiar: College: Interested: 148: 44: 16:176:123: with in Blister: :Scouting: do 120: 72: 23: Blister Rust Knowledge

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Table 43 gives a summary of the summer's work in all of the associations in northern Idaho. The first set of figures given for the Priest Lake Timber Protective Association is for the work done by the two men who were doing educational work, scouting and some reconnaissance work while the second set of figures is for the men who were doing only reconnaissance work. A full report of the latter work is given under D (3.52) Page 120.

Results of Summer's Work on Priest Lake Timber Protective Association.

I. Educational Work:

During the summer as far as possible all members of the Association were visited at their field stations. The whole blister rust situation was discussed with them and specimens of the disease on white pine (in glass tubes) and on currant leaves (in celluloid cases) were provided for their examination. Specimens of the wild currants and gooseberries which were growing in the vicinity of their field station were collected and brought to the station. They were instructed in the methods of recognizing the different species. Table 44 shows the number of such employees with whom contact was established. This table also gives a rough classification of the men as to their experience as woodsmen, whether they were interested in general forestry, and their apparent reaction to blister rust. This table shows that of the 10 employees of the Association who were interviewed, none had any previous knowledge of blister rust. Most of these men became interested in blister rust and were on the lookout for the disease. Since there appears a possibility of securing active scouting for the disease by most of the members of the Association, they should be kept constantly informed regarding the disease and all new members should be instructed each year.

II. Scouting for the disease:

In traveling from station to station the two men engaged in blister rust educational work traveled on foot. During this time as well as during their scouting around each station these men were constantly on the lookout for the disease. Several specific areas were reported as probably being infected with blister rust, but upon examination of these areas no blister rust was found to be present. As far as is known at present the Association territory is free from blister rust. Scouting should be continued so that as soon as blister rust occurs on the association, the facts will be known and immediate action taken to combat it.

III. Reconnaissance Work:

Table 43 shows that 11756 chains of reconnaissance strips one rod wide on 23512 acres were run in the Association by the four crews

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Results of Summer's ork on Priest Lake Timber Protective

I. Fducetionel Fork:

partny the swarer as far as mossible all members of U.e Association our violited at their field stations. The whole blirter met situation was discussed with them and specimens of the diam se on white pine (in aless tubes) and on current leaves (in celluloid opses) were provided for their exemination. Specialis of the will durrente and gooseberries which were growing in the vicinity of their field station vere collected and brought to the station. They were instructed in the methods of recognising the different species. Rable 14 shows the number of such omployees with whom contact was entablished. This table also giver a rough clessification of the mer as their experience as woodsmen, whether they w re interested in general forestry, and their appearent reaction to blister rust. This table shows that of the 10 employees of the Association who were interviewed, none had ony previous knowledge of blister rugt. Most of there men become interested in blister rust and were on the lookout for the disease. Since there appears a possibility of securing active scouting for the disease by most of the members of the Association, they should be kept constantly informed reserding the disease and all new members aloudd be instructed each year.

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that were in the field last season. The map which accompanies this report shows the areas where the reconnaissance work was done. All records and maps made during this work are on file in this Office and are available to the Association. The strips were generally run every quarter mile and at a stream, at right angles to the contour lines toward the top of the drainage or to the limits of white pine. In this work complete data were taken on all timber, Ribes, brush, windfall, topography and other factors which will influence the cost of Ribes eradication.

Table 45 gives a brief summary of the conditions on each of these areas without reference to age classes.

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Table 45 gives a brief runnary of the conditions on each of there areas without reference to age classes.

TABLE MAY Summary of Condition on Sample Areas on Priest Lake Timber Protective Association

T.58 N.R. FHW Center: 3. Sec. 24	Sec	N.W. L Sec. 24 East River-Middle		1 Priest Lake N.R.4W.N.3 Sec.: E.3 Sec. 8	7	27	be	Name	Area : Size :
:2750 :C-W.P.: :Mature 18 DBH 374: to :D.F. :187:Poles 64 Age :3800 :Y.PH: :Rep. 73 Age	: F. P. Y.: :274: Poles 7: : Rep. 71	:2800 :D.FC: :Mature 7 DBH	14065 : C - H : : : : : : : : : : : : : : : : : :	:CWpP: :Mature 13 :H :206:Poles 20 :W.F. : :Rep. 159	:5668 :C-H : :Rep. 64 Age :3000 :W.F.C.: :Mature 6 DBH 242: to :HW.P:121:Poles 5 Age :3340 :D.F. : :Rep. 185 Age		:2350 : D.F. : :Mature & DBH 726: to :W.F.Y.:363:Poles 5 Age :3316 :P.W.P.: :Rep. 113 Age	No. Chair Strips	Elev. Stand
8-12 :Mature 42 DBH 50-80 :Poles 143 Age 25-40 :Rep. 377 Age	15-40 : Rep. 418	8-20 :Mature 44 DBH	10-45 : Rep. 975 Age	8-18 :Mature 66 DBH 50-90 :Poles 121 Age 20-40 :Rep, 1656 Age	03-1	12-30 :Mature 84 DBH	8" -18":Mature 39 DEH 8" -24" 60-100 :Poles 29 Age 70-175 10-35 :Rep. 1060 Age 15-60	ne : Wixed .	Timber per Acre
00: 3:20: 7:189::196	5 : 3:20: 6:158: 9:173		30: 3:20:17:207: :224	30: 4:15:11: 81:: 92	0 : : : : : : : : : : : : : : : : : : :	00: 2:15:23:: 23	15 : 3:20:16:113: :129	Density Frickly Current Sticky Current Maite S Gonseber	Brush : Ribes per Acre

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Results of Summer's Work on Pend Oreille Timber Protective Association

I. Educational Work:

During the summer as far as possible all members of the Association were visited at their field stations. The whole blister rust situation was discussed with them and specimens of the disease on white pine (in glass tubes) and on current leaves (incelluloid cases) were proveded for their examination. Specimens of the wild currants and gooseberries which were growing in the vicinity of their field station were collected and brought to the station. They were instructed in the methods of recognizing the different species. Table 44 shows the number of such employees with whom contact was established. This table also gives a rough classification of the men as to their experience as woodsmen, whether they were interested in general forestry, and their apparent reaction to blister rust. This table shows that of the 20 mcn interviewed 10 had some previous knowledge of blister rust while the remainder had no apparent knowledge of the disease. Most of these men were interested in blister rust and will do some scouting for the disease, Since there appears a possibility of securing active scouting for the disease by most of the members of the association, they should be kept constantly informed regarding the disease and all new members should be instructed each year.

II. Scouting for the Disease:

In traveling from station to station the two men engaged in blister rust work traveled on foot. During this time as well as during their scouting around each station these men were constantly on the lookout for the disease. Several specific areas were reported as probably being infected with blister rust, but upon examination of these areas no blister rust was found to be present. As far as is known at present the association territory is free from blister rust. Scouting should be continued so that as soon as blister rust occurs on the association, the facts will be known and immediate action taken to combat it.

III. Reconnaissance Work:

Table 43 shows that 1794 chains of reconnaissance strips were run, the records of which are on file in this office. The strips were one rod wide. They were generally started at a stream, and run at right angle to the contours toward the top of the drainage or to the limits of white pine. In this work complete data were taken on all timber, Ribes, brush, windfall, topography and other factors which will influence the cost of eradication,

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III. Recounsissance fork:

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The following is a brief statement of the results of the reconnaissance work on each of the areas studied. More complete information is contained in Table 46.

A. Area in T.59 R. 2W. Sec. 35

This is a small area of about 70 acres which was burned over in 1919 I Since the burn is quite recent there is very little reproduction on the area. At present there are about six larch seedlings per acre. Wild currents and gooseberries have not as yet reestablished themselves.

B. Area in
T. 59, R. 2 W., Sec. 3, 4, 9, and 10.

This area of approximately 152 acres is of 1903 burn. The present stand consists of a mixture of white pine, cedar, larch and hemlock, mostly under 18 year old. There is an average of 272 poles per acre, about 18 years old and 3194 seedlings about 8 years old. About 15% of the stand is white pine. The prickly and sticky current and the white stemmed gooseberry were found on the area, averaging about 23 bushes per acre. They appear to be quite generally distributed over the area.

C. Area in Upper Pack River Prainage. T.60, R. 2W, Sec. 4, 5, 6. T.61, R. 2W, Sec. 28, 29, 32, 33.

This area of about 928 acres represents a white pine, cedar, white fir, hemlock forest in its virgin state lying on the upper drainage of Pack River. There is an average of about 174 mature trees per acre, 12-36 inches in diameter, 357 poles, 30 to 50 years old and a heavy understory of reproduction of 3194 trees, 15 to 20 years old. Of the entire stand white pine makes up about 3½ percent. Since this is primarily a mature stand a better idea of the importance of white pine in the stand is gained when it is realized that about 30% of the mature trees is white pine. The only wild currents found on the area, the prickly current, which appears to be cuite generally distributed, averages about 41 bushes per acre,

D. Pack River T. 60, R. 2W. Sec. 4 and 9

This is a small area of 1910 burn lying northeast of Pack River chiefly in Sections 4 and 9. One strip was run across this area. There is very little mature timber or poles left on the area but there is an average of 5488 seedlings per acre, of which 22 percent is white pine. Only one species of Ribes is established on the area, the prickly current, averaging 6 bushes per acre.

The following is this statement of the results of the recomplication is sense work on each of the press studied. More complete information is contained in Table 16.

k. Area in T.59 E. 2. Sec. 35

This is a crell area of about 70 acres which was burned over in 1919. Since the burn is authorneent there is very little reproduction the area. At present there are about six larch soldlings per acre. Wild currents and gooscberries have not as yet reentablished themselves.

R, Arts i. T. 59, R. & ... Sec. 3, 4, 9, and 10.

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C. Ares in Upper Pack River Preinege. r.60, E. 2%, rec. b. 5, 6. T.61, R. 2%, Sec. 23, 29, **32**, 33.

This area of about 325 acres represents a white vine, redar, white fir, hemlock forest in its virgin state lying on the upper drainage of Fack Riven. Those is an average of chout 174 rature trees per acre, 12-36 inches in direction, 257 poles, 30 to 50 years old and a heavy understory of reproduction of 3194 trees, 15 to 20 years old. Of the entire stand white pine makes up about 32 percent. Since this is primarily a mature stand a better idea of the importance of white pine in the stand is gained when it is realized that about 30% of the mature trees is white pine. The only wild currents found on the area, the prickly current, which appears to be cuite generally distributed, everages about 41 bushes per acre.

D. Peck River
T. 60, R. 89. Sec. 4 and 9

This is a small ores of 1910 hurn lying northeast of Rock River chiefly in Sections 4 and 9. One strip was non-cross this cres. There is vary little mature timber or poles left on the area but there is an evenage of 5488 shedlings per sone, of which 22 parkent in white pine. Only one species of Ribes is established on the ores, the prickly current, everaging 6 bushes per sore.

E. Little Fall Creek Area
T. 61, R. 1W. Sec. 29, 30, 31 and 32

This area consists of about 1040 acres of virgin white pine, hemlock, cedar and white fir timber on the upper drainage of the North Fork of Pack Creek. On this area there is an averageouf 167 mature trees per acre, 12 to 30 inches in diameter; 292 poles, 30 years old and 1171 seed—lings about 10 years old. Of the mature timber 30 percent is white pine. Only one species of Ribes was found, the prickly current, which averaged only three bushes per acre.

F. Sand Creek Area.
T. 58, R. 2 W., Sec. 33 and 34
T. 57, R. 2 W., Sec. 4 and 5

Most of the drainage of Sand Creek was burned over during 1894. Approximately 744 acres in the center of this area, about half on each side of the creek, were studied. The present stand consists of poles and reproduction of white pine, cedar, Douglas fir, Larch and hemlock. The 454 poles per acre are about 20 years old while the 1273 seedlings are about 10 years old. About 24 percent of the stand is white pine. Two species of Ribes were found on the area, the sticky current and the prickly current. These two averaged about 39 bushes per acre.

G. Lightning Creek Area
T. 58, R. 1 E., Sec. 10, 11, 15 and 22.

This is a mature stand composed of white pine, cedar, hemlock and Douglas fir, located on the south side of Lightning Creek in the above sections. About 528 acres were examined in this area. The stand averages 335 trees per acre, 12 to 30 inches in diameter; 599 poles 50 years old; and 1846 trees under pole size, about 30 years old. Of the trees larger than poles, 35 percent is white pine. The prickly current, averaging 6 bushes per acre, was the only Ribes found on the area.

E. Little Fall Creek Area T. 61, F. L., Sec. 29, 30, 31 and 32

This area consists of about 1040 acres of virgin white pine, hemlock, cefor and white fir timber on the upper drainage of the Morth Porof Pack Creek. On this area there is an averageouf 107 mature trees per acre, 12 to 30 inches in diameter; 292 poles, 30 years old and 171 seed-lings about 10 years old. Of the mature timber 70 percent is white pine. Only one species of Ribes was found, the prickly current, which sveraged only three bushes per acre.

F. Sand Oreck Ares.

T. 53, P. 2 1., Sec. 33 and 34 T. 57, P. 2 h., Sec. 4 and 5

Most of the drainer of Sand Creek was burned over during 1894, Approximately 744 acres in the center of this eres, about half on each sid of the creek, were studied. The present stand consists of poles and reproduction of white pine, coder, Douglas fir, Larch and hemlock. The 454 poles per sore are about 20 years old while the 1273 seedlings are about 10 years old. About 24 percent of the stand is white pine. Two species of Ribes were found on the area, the sticky currant and the prickly currant, These two overaged about 39 bushes per acre.

G. Lightning Greek Area T. 58, R. 1 E., Sec. 10, 11, 15 and 22.

This is a meture stand composed of white pine, ceder, hemlock and Louglas fir, located on the south side of Lightning Creek in the above sections. About 525 acres were examined in this area. The stand averages 335 trees per acre, 12 to 30 inches in dismeter; 539 poles 50 years old; and 1846 trees under pole size, about 30 years old. Of the trees larger than poles, 35 percent is white pine. The prickly current, averaging 6 bushes per acre, was the only Ribes found on the area.

Summary of Reconnaissance Work on Pend Orielle Timber Protective Association TABLE XLVI

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Results of Summer's Work on Potlatch Timber Protective Association.

1. Educational Work:

During the summer as far as possible all members of the Association were visited at their field stations. The whole blister rust situation was discussed with them and specimens of the disease on white oine (in glass tubes) and on current leaves (in celluloid cases) were provided for their examination. Specimens of the wild currants and gooseberries which were growing in the vicinity of their field station were collected and brought to the station. They were instructed in the methods of recognizing the different species. Table 44 shows the number of such employees with whom contact was established. This table also gives a rough classification of the men as to their experience as woodsmen, whether they were interested in general forestry, and their oppoarent reaction to blister rust. This table shows that of the 20 men interviewed 10 had some previous knowledge of blister rust while the remainder had no apparent knowledge of the disease. Most of these men were interested in blister rust and will do some scouting for the disease. Since there appears a possibility of securing active scouting for the disease by most of the members of the association, they should be kept constantly informed regarding the disease and all new members should be instructed each year.

II. Scouting for the disease:

In traveling from station to station the two men engaged in thister rust work traveled nearly 400 miles on foot. During this time as well as during their scouting around each station these men were constantly on the lookout for the disease. Several specific areas were reported as probably being infected with blister rust, but upon examination of these areas no blister rust was found to be present. As far as is known at present the association territory is free from blister rust. Scouting should be continued so that as soon as blister rust occurs on the association, the facts will be known and immediate action taken to combat it.

III. Reconnaissance work:

Table 43 shows that 1794 chains of reconnaissance strips were run, the records of which are on file in this office. The strips were one rod wide. They were generally started at a stream, and run at right angle to the contours toward the top of the drainage or to the limits of white pine. In this work complete data were taken on all timber, Ribes, brush, windfall, topography and other factors which will influence the cost of eradication.

The following is a brief statement of the results of the reconnaissance work on each of the areas studied. More complete information is contained in Table 47.

A. Moore Creek Area; T.41 R. 1W. Sec. 14, 15, 22, 23, 26, 27, 34

This area of approximately 2500 acres was cut over and burned during the years 1908-1914. The reproduction now represent a stand of white pine,

Results of Summer's work on Potlatch Minder Pritactive Association.

1. Educational York:

During the summer is far a possible all members of the Association were visited at their field stations. The whole blister rust situation was discussed with them and specimens of the disease on white c (in glass tubes) and on current leaves (in cellulaid cases) were orovided for their examination. Specimens of the will currents and rooseberries which were growing in the vicinity of their field station were collected and brought to the station. They were instructed in the method: of recognizing the different species. Table 44 shows the number of such employees with whom contact was established. This able also gives a row classification of the men as to their experience as woodsmen, whether the were interested in general forestry, and their apparent resotion to blists rust. This table thows that of the 20 men interviewed 10 had some previous knowledge of blister rust while the remainder had no sopprent knowledge of the disease. Most of these men were interested in blister runt and will do some scouting for the live co. Since there appears a possibility securing active scouting for the diserse by most of the members of the association, they should be kept constantly informed vegording the disense and all new members should be instructed each year,

II. Scouting for the disease:

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III. Seconnaissance work:

Table 45 shows that 1794 chains of reconnaissance strips were the generals of which are on file in this office. The strips were one rod wide. They were generally started at a stream, and run at right angle to the contours toward the top of the drainage or to the limits of white air In this work complete data were taken on all timber, Ribes, brush, windfatopography and other factors which will influence the cost of eredication.

The following is a brief statement of the results of the reconnaiseance work on each of the grees studied. More complete informat is contained in Table 47.

A. Moore Greek Ares; T.41 R. II. Sec. 14, 15, 22, 23, 26, 27, 35.

This area of approximately 2500 eares was cut over and burned during the years 1908-1914. The reproduction now represent a stand of white pine,

white fir, and larch. There is an average of 122 trees of an average age of 10 years on the area, 45, or approximately 38 percent, of which are white pine. The area is fairly free from Ribes, averaging only three plants of Prickly Currant per acre. Other conditions are found on the area are shown in the summary table.

B. Len Boehls Area:

T.41 R. 4 F. Sec. 35 East of River and Sec. 36

T.41 R. 5 E. Sec. 31 Western half.

T.40 R. 4 E. Sec. 2 East of river and all of Sec. 1

This area represents a western slope on the east side of the Little North Fork, or approximately 1536 acres. It was probably burned over in about 1900. The slope is covered with white pine, cedar Douglas fir, and white fir. An average per acre of 14 trees 10 to 22 inches DBHs 40 poles 25 to 40 years old and 511 young trees 4-20 years old, were found on the area. Of these totals there was an average of 1 mature, 4 poles and 70 trees reproduction of white pine per acre or approximately 13% white pine. The Sticky Current, the only species of Ribes found, averaged 19 bushes per acre. More detailed details regarding the area are shown in the summary table.

C. Cranberry Creek Area:

T. 39 R. 3 E. Sec. 32

T. 38 R. 3 E. Sec. 5 North half.

Most of this area is rather flat. The timber type is white pine, white fir, cedar, consisting of trees 100 to 150 years old with an understory of young growth 30-60 years old. The area averaged 67 trees per acre, 14 to 36 inches DBH 83 poles 50 to 150 years old and 265 trees under pole size, 30 to 60 years old. Of this number there is the following white pine per acre: 14 mature class, 6 poles and 21 under pole size or approximately 10% white pine. The area is practically Ribes free, averaging less than one prickly current per acre. Sticky current, however, occurs in patches in the small areas cleared by homesteaders. Hore complete data are given in the summary table.

D. Mason Meadows Area on Dick's Creek.
T. 38 R. 1 R., South half of sec. 7 and 8 and north half of Sec. 18 and 19.

This area of appro ximately 1088 acros is located on the upper drainage of the south fork of Dick's Creek. It is bounded on practically all sides by old burns 1894 and 1896. These burns now represent reproduction thickets. The timber on the area is white pine, ceder and white fir. The area averaged 66 trees per acre 14 to 32 inches DBH, 79 poles 50-130 years old, and 511 trees under pole size 10 to 50 years old. Of this number there were 12 mature, one pole and 46 trees reproduction of white pine per acre of about 9 % white pine. The Prickly Currant, the only species found on the area averaged 3 bushes per acre. The summary table gives more details regarding the area.

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Summary of Reconnaissance Work on Potlatch Timber Protective Association TABLE XLVII

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:4000-:W.F. : 1088:4310 :C, :	1080:1965-:Cedar::	1536:3035 :D.F.	1545-:C.	Elev. Stand 2850-W.F. 2900 L. 1908-14
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Results of Summer's Work on Clearwater Timber Protective Association

I. Educational Work:

During the summer as far as possible all members of the Association were visited at their field stations. The whole blister rust situation was discussed with them and specimens of the disease on white pine (in glass tubes) and on current leaves (in celluloid cases) were provided for their examination. Specimens of the wild currents and gooseberries which were growing in the vicinity of their field station were collected and brought to the station. They were instructed in the methods of recognizing the different species. Table No.44 shows the number of such employees with whom contact was established. This table also gives a rough classification of the men as to their experience as woodsmen, whether they were interested in general forestry, and their apparent reaction to blister rust. This table shows that of the 60 men interviewed 24 had some previous knowledge of blister rust while the remainder had no apparent knowledge of the disease. Most of these men were interested in blister rust and will do some scouting for the disease. Since there appears a possibility of securing active scouting for the disease by most of the members of the association, they should be kept constantly informed regarding the disease and all new members should be instructed each year.

II. Scouting for the Disease.

In traveling from station to station the two men engaged in blister rust work traveled 375 miles on foot. During this time as well as during their scouting around each station these men were constantly on the lookout for the disease. Several specific areas were reported as probably being infected with blister rust, but upon examintion of these areas no blister rust was found to be present. As far as is known at present the association territory is free from blister rust. Scouting should be continued so that as soon as blister rust occurs on the association, the facts will be known and immediate action taken to combat it.

III. Reconnaissance Work:

Table 43 shows that 1167 chains of reconnaissance strips were run, the records of which are on file in this office. The strips were one rod wide. They were generally started at a stream, and run at right angle to the contours toward the top of the drainage or to the limits of white pine. In this work complete data were taken on all timber, Ribes, brush, windfall, Topography and other factors which will influence the cost of eradication.

The following is a brief statement of the results of the reconnaissance work on each of the areas studied. More complete information is contained in Table 48.

A. White Pine Creek Ares-T.40N, R. 6E, Sec. 15 and 22.

This is a stand of timber 14 to 24 inches in diameter, 74% of which is white pine. Two species of Ribes were found in the area, the prickly current and the sticky current. The prickly current usually occurs along streams and springy places. This sample area was found to have on an average 52 Ribes bushes per acre.

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I. Educational .out:

During the summer as far as possible all members of the A sociation were visited at their field sighing. The whole blister rust situation was discussed with them and speciment of the disease on white sine (in alasa tubes) and on current legves (in cellulaid egree) were provided for their examination. Specimens of the vild currents and mooseborries which were arower in the vicipity of their field station were collected and brought to the station. They were instructed in the methods of recognizing the different species. Reble No.1 shows the number of such employees with whom contact was established. This table also gives a rough classification of the men as to their apparience as woodsmen, whather they were interested in general for stry, and their songwent reaction to Ditater rust. This table shows that of the 50 men interviewed 24 had some previous knowledge of blinter rust while the renginier had no goverent knowledge of the disagse. Most of there men were interested in blister rust gad will to arms scouting for the firegree. Since there enceses a nossibility of securing active conting for the disease by most of the numbers of the essociation, they should be kept constantly informed regarding the disease end all new members should be instructed each year.

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The following is a brief etstement of the results of the reconneissand work on each of the great studied. More complete information is contained in Table 48.

A. White Pine Greek Ares-I.40M, A. 6E, Sec. 15 and 22.

This is a stand of timber 14 to 24 inches in Signeter, 74% of which is white pine. Two species of Hibes were found in the res, the prickly curvant went and the sticky current. The prickly current neually occurs along streams and springy places. This sample area was found to have on an everage 52 Hibes bushes per acre.

B. Beaver Creek Area T.39, R.6E, Sec. 6 and 8 T.39, R.5E, Sec. 1 and 2 T.40, R.5E, Sec. 35

The part of this area which lies in Sections 1, 2 and 35 is an old burn with Bertha Hill as its center while that portion in Sections 6 and 8 is in virgin timber. Both in the reproduction and in the virgin timber white pine runs from 33 to 50% of the stand. Three species of Ribes were found on the area, the prickly, sticky and stink currant. The prickly and sticky currants are generally distributed over the area and average 55 bushes per acre. The stink currant occurs in densemments along all of the streams except the small ones which flow down through narrow canyon channels. In a narrow belt about 20 to 40 feet along most of the streams the stink currant will average 500 to 600 bushes per acre.

C. West Beaver Creek
T.39, R.6E. Sec. 7

The study of a small portion of this territory indicates that there is a good stand of mature timber 12" to 42" in diameter with an understory of reproduction 5 to 15 years old. About 33% of the stand is white pine. The prickly and sticky current were found generally distributed over the area, averaging 70 bushes per acre. The stink currents were found in dense mats along the streams.

D. Alder Creek
T.39, R.5E, Sec. 22, 23, 24 and 25

This is an old burn with very little mature timber on the area. However, there is a good stand of poles and reproduction on the area running from 5 to 40 years old. About 34 per cent of this stand is white pine. The prickly and sticky currant were generally distributed over the area, averaging 312 bushes per acre. The pine seemed to have killed out all the stink currants which normally occur along the streams in this region.

E. North Fork Reeds Creek. T.38 N, R.5E. Sec 14, 15, 16 and 21

This is a virgin stand of timber averaging from 10 to 26 inches in diameter. About 75 percent of the stand is white pine. There is also a good stand of poles 30 to 60 years old, about 50 percent white pine. The heavy understory of reproduction is chiefly other species than white pine. The prickly currant was found generally distributed over the area, averaging 19 bushes per acre. In the boggy places and along the larger streams dense patches of the stink currant were found.

F. South Fork of Reeds Creek. T.38, R. 5E, Sec. 22, 23, 26, 27.

This is a virgin stand of timber composed of about 30 percent white pine. The prickly and sticky current averaged 12 bushes per acre. Stink current occurs in dense patches along the streams.

B. Besver Oreol. Area.
T. 39, R. 62, Sec. 5 and 8
m. 39, R. 52, Sec. 1 and 2
m. 40, R. 52, Sec. 35

The pert of this cree which lies in Sections 1, 2 and 35 is an old burn with Pertha Hill as its center while that portion in Sections 6 and 8 in virgin timer. Soth in the reproduction and in the virgin timber white pine runs from 35 to 50 for the election. The species of Ribes war found on the area, the prickly, sticky and stink current. The prickly and sticky out rants are generally distributed over the area and average 55 bushes per acres the ctink current occurs in dense and a long all of the streams ercept the amall ones which flow fown through arrow canyon channels. In a narrow belt about 20 to 40 feet along most of the streams the stink current will everage about 20 to 500 bushes per acre.

C. Rest Beever Creek T.79, R.6E. Sec. 7

The study of g angell portion of this territory indicates that there is g good along of a store timber 120 to 420 in dirmeter with an understory or reproduction 5 to 15 years old. About 33% of the chand is white pine. The prickly and atticky current ever found generally distributed over the area, everaging 70 lushes per sole. The ation currents were found in dense mats slong the streams.

L. 113er (reek D.39, 5.55, Sec. 29, 27, 24 smc 25

This is an old burn with very little mather timber on the erea. However, there is a good stead of poles and reproduction on the erea running from 5 to '00 years old. About 34 per cent of this stend is white night prickly and timey current were sensibly distributed over the ones, even aging 312 bushes per sore. The pine seemed to have killed out all the stink currents of inh normally occur clone the stream in this region.

H. Morth Fork Reeds Creek. T.38 M. R.5B. Sec 14, 15, 16 and 21

Tir is a virgin stand of timber averaging from 10 to 26 inches in diameter. About 75 percent of the stand is with time. There is also a vocation of noise 30 to 60 years old, about 50 percent white pine. The benry understory of reproduction is chiefly other species than white pine. The prickly current was found remerally distributed over the arch, averagine 19 bushes per sore. In the horsy places and wlong the larger atreads dense octobes of the stink current wars found.

F. South Fork of Reads Creek. T.33, N. 5M, Sec. 22, 64, 26, 27.

M

This is a virgin stand of timber composed of about 30 percent whit pine. The pricaly and attacky current averaged 12 bushes mer sere. Stink current occurs is dense patches along the strayms.

G. Scofield Creek
T.38, R. 6E, Sec. 5

This area is part of a 1914 burn. The reproduction represents an average per acre of 1596 seedlings 5 to 10 years old. 80 percent of the reproduction is white pine. The prickly current was the only Ribes found on the area. It averaged 126 bushes per acre and was distributed quite generally.

G. Scofield Creek
T. 38, R. 6E, Sec. 5

File sree is not of a 191 hum. The reproduction represents an average per acre of 1976 seedlings 5 to 10 years old. 80 percent of the reproduction is white whe. The oriesty charant was the only hibes found on the averaged 100 metre per acre and " a list aboved quite senerally.

Summary of Reconnaissance Work on Clearwater Timber Protective Association TABLE XLVIII

1914 Burn :	T. 38, R. 6 E. Sec. 5 :	Scofield Creek ;	23, 26, 27.	T. 38, R. 5E, Sec. 22. :	South Fork Reeds Creek:	Sec. 14, 15, 16, 21 :	, , ,	West Fork Reeds Creek :	Sec. 22, 23, 24, 25.	n. 39, R. 5 E.	Alder Creek		T. 39, R. 6E., Sec. 7:	West Beaver Creek :	2. T.40, R. 5E. Sec. 35.	Sec. 6,8. T. 39, R. 5E. Sec. 1:	Begver Creek, T. 39,R.61	Sec. 15, 22.	T. 10, R. 6 E.	White Pine Creek :	e a e	•	Name		••	Area
: :H. : :Rep. 1:	: 21:Poles	: :W.P. : :Mature	: Rep.	28 : 3400 :W.F. :139:Poles	:3185-:W.P. : Mature	: D. FC: : Rep.	597 :3340 :W.F. :299:Poles	Meture	:W.F. Rev.	:D.F. :155:Poles	:3300-: W.P. : : Mature	: Rep.	96 : 3660 :W.F. : 56:Poles	:3400-:W.PH:	:D.F. :Rep	556 :5550 :W.FC:278:Poles	:3500-: W.P. : : Mature	: :S, : :Rep,	288 :4044 : W.F. :144: Poles	.W.P. :Mature	no. Str		ch ps. White	Acres):	Size :Elev.:Stend : :	*Timber:
1276 Age 5-10: Rep. 320 Age 5-10:	Age 40 :Poles	O :Mature O DEH	98 Age 8-20: Rep. 440 Age 3-20:	49 Age 40-60: Poles 76 Age 35-70:	DBH 10-26: Mature 50 DBH	45 Age 5-25: Rep. 488 Age 5-25:	Age 30-60: Poles 75 Age	10-26:Mature 39 DBH	Age 5-10: Rep. 886 Age	es 135 Age	12-36:Mature 11	300 Age 5-15: Rep. 630 Age 15 :	90 Age	DBH	345 Age 5-13: Rep. 685 Age 10-40:	Age 28-42: Poles 94 Age	14-38: Mature	39 Age 4-15: Rep. 96 Age 5-12:	19 Age 30-60: Poles 42 Age 40 :	132 DBH 14-24: Mature 47 DBH 14-18:		•	te Pine : Mixed :	••	••	Timber per Acre
••	4:30:126: 0: 0:126	••		2:30: 11: 1: 0: 12	••	Tright or the depth of the control o	3:30: 19:: **: 19	••	The community of the co	5:60: 45:279: 0:312	**	The state of the s	3:40: 65: 0: 5: 70			4:50: 42: 13: * : 55	•••		3:50: 50: 2: 0: 52	••	St Cu St Cu	i(r)	ck ra ck ra k	nt	田 七	Brush : Ribes per Acre

^{*} Dense mats along streams

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oniq əfin	Meture 138 Polos 19	HEGO ORS STUTEM: SSA E4 RESIDE: RTS SSA E45 . TEX:	50 7	Rep. 103	ASA ZH . TOS.: HEU OS OUTONI. HEU OS OUTONI. SEA OH SIOT. OE	Par O orden: Par SI esfoq: FG Par AISI
Timber per Acre	14-24: Mature 47	The series of Se	15-55:201es 90	IS-10: Meture II	884 ,998;38-7 00 statem:0S-01 07 as 109:02-04 044 ,998:0S-8	Osc. ges. Of
Oensity & Filler Prickly & Stink Current Current Current Current Total Total	11-18 3:50 Oct.	Age 10-40: 4:50: 42: * : 55 Age 40-58: 4:50: 42: * : 55	DUB 15-50: 2:mp: 02: 0: 2: 40	7 0 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Ase 35-70; 3:30; 10;; **; 15 Ase 5-70; 3:30; 11; 1; 0; 12 Ase 35-70; 3:30; 11; 1; 0; 12	Age 5-10: 1:30:126: 0: 0:126

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Results of Summer's Work on Coeur d'Alene Timber Protective Association

1. Educational Work:

During the summer as far as possible all members of the Association were visited at their field stations. The whole blister rust situation was discussed with them and specimens of the disease on white bine (in glass tubes) and on current leaves (in celluloid cases) were provided for their examination. Specimens of the wild currents and gooseberries which were growing in the vicinity of their field station were collected and brought to the station. They were instructed in the methods of recognizing the different species. Table 44 shows the number of such employees with whom contact was established. This table also gives a rough classification of the men as to their experience as woodmen, whether they were interested in general forestry and their apparent reaction to blister rust. This table shows that of the 67 men interviewed 39 had some previous knowledge of blister rust while the remainder had no apparent knowledge of the disease, Most of these men were interested in blister rust and will do some scouting for the disease. Since there appears a possibility of securing active scouting for the disease by most of the members of the association, they should be kept constantly informed regarding the disease and all new members should be instructed each year.

II. Scouting for the Disease:

In traveling from station to station the two men engaged in blister rust work traveled 676 miles on foot. During this time as well as during their scouting around each station these men were constantly on the lookout for the disease. Several specific areas were reported as probably being infected with blister rust, but upon examination of these areas no blister rust was found to be present. As far as is known at present the association territory is free from blister rust. Scouting should be continued so that as soon as blister rust occurs on the association, the facts will be known and immediate action taken to combat it.

III. Reconnaissance Work:

Table 43 shows that 393 chains of reconnaissance strips were run, the records of which are on file in this office. The strips were one rod wide. They were generally started at a stream, and run at right angle to the contours toward the top of the drainage or to the limits of white pine. In this work complete data were taken on all timber, Ribes, brush, windfall topography and other factors which will influence the cost of eradication.

The following report by Mr. Rodner gives a summery of the preliminary observations on conditions in the Association as observed by these educational men during the summer.

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During the conner se far ar possible oll mambers of the Association " or visited of their field stations. The shole blister rust sin tion is discussed with them and solutions of the disease on white wine (in there twice) and on current leaves (in celluloit apport, when anytided for their some ination. Specimens of the mild currents and socced miles which were growing in the vicinity of their field station were collected and brought to the striken. They are instructed in the methods of recomining the inferent straigs. Table the room the number of such employeer with whom content is entablished. This table also siver a rough al seificetion of the men as to " wir exceptence se woodned, whether they were intrasted in semeral forectry on their supercut reaction to blister muct. This table show that of the 67 mon interviewed 39 had some previous showledge of blister rust wille blooms similer by dono apparent and ledge of the divise. Most of these wen ere interested in dister rust and will do sone scouting for the direagn. Fince them a possibility of corrigh active couting for the Chreese by most of the members of the responsion, they should be kept one tratly informed recording the essence of all now members should be in trueted ench year.

11. scouting for the margre:

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III. Mecon cirrence fork:

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The follo ing report by the gives a summery of the grain observations on conditions in the Association as observations the concentrations. The commentations are considered the commentations of the commentations of the commentations of the commentations.

A REPORT ON THE CONDITIONS AS FOUND WITHIN THE BOUNDARIES OF THE COEUR D'ALENE TIMBER PROTECTIVE ASSOCIATION, RELATIVE TO THE BLISTER RUST PROBLEM

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Jack W. Rodner

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The field work as carried on, during the summer of 1924, falls naturally into two main divisions.

I. Educational.
II. Reconnaissance.

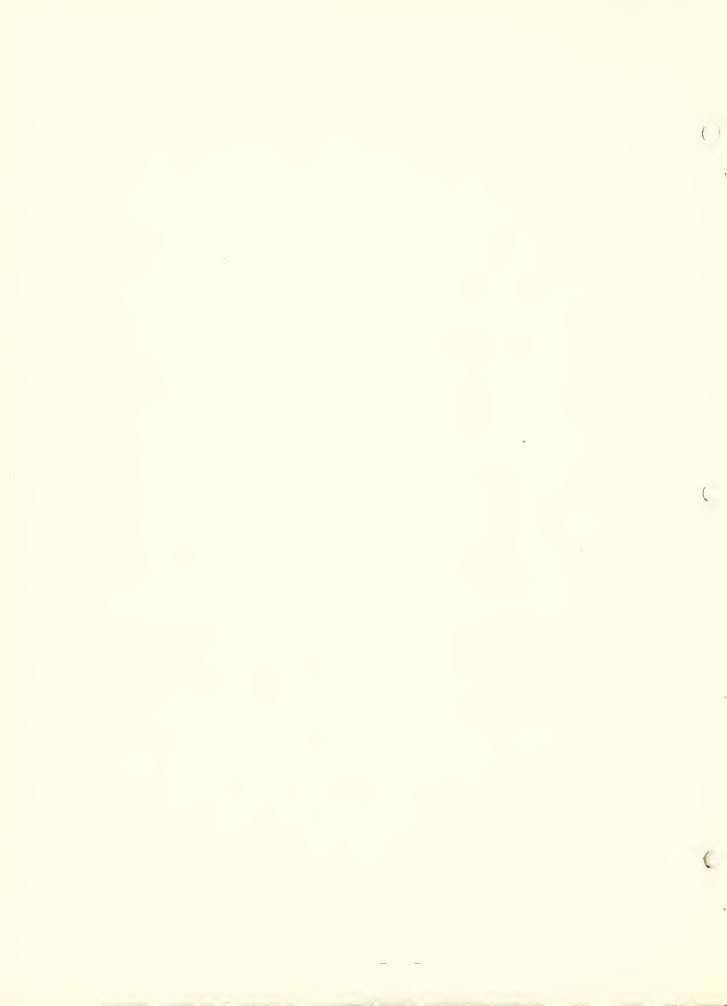
The educational program, which occupied slightly over one third of the total time, proved to be far more successful than was anticipated. It is undoubtedly true that little can be shown in the way of tangible results at the present time. The encouraging feature of this work was the unmistakable interest evidenced by the patrolmen in the field. Almost without exception the men interviewed, requested more information and a more detailed idea of the disease. Throughout the field season many of the patrolmen sent in specimens for examination, proving that the idea of the importance of Blister Rust, had become firmly fixed in their minds. With this large force of men in the field, each with a definite knowledge of the rust, it is more than likely that any isolated infection will be picked up, which otherwise might escape detection for a period of years. The educational program ranks in importance with the reconnaissance work carried on, and will prove a valuable adjunct in Blister Rust Control.

Out of the entire force of seventy-one men, sixty-one men were interviewed during the course of the summer. This will leave, even under unfavorable conditions, a comparatively large force of men in the field next summer, who are familiar with Blister Rust.

The reconnaissance program was, necessarily very extensive. It was evident from the beginning of the field season that it was a hopeless task for two men to attempt an intensive survey of so large an area. All data obtained on specified areas was given as broad an application as conditions and types would warrant. The work is in no sense complete and should be carried on, otherwise the past summers work will mean very little.

The Association may be most handily subdivided into the four main drainage areas; I, The Benewah; II, The St. Maries River; III, the St. Joe River; IV, the Cocur d'Alene River drainages.

Aside from the general observations, certain restricted areas, were covered intensively, in all cases an attempt was made to locate these blocks, so as to represent as far as possible average conditions. The result of these investigations plus, the general notes form the basis of the following report:



THE BENEWAH

In this particular section of the country, both the mature white pine and the second growth white pine, occur in good stands. From the best available source of information much of the mature white pine will run above 9 M board feet per section. There are also several sections of excellent white pine reproduction, which if given protection will ultimately form a valuable stand of timber. The remainder of the territory is either cut over, burned or slashed and burned.

Black currant growth is heavy along the lower portions of the creek drainages. Prickly currant and sticky currant will run on an average about the same on the entire area. The bushes with the exception of the black currant do not occur in dense masses but occupy the more favorable situations. They will perhaps not average more than 50 to 100 bushes per acre. The black currant growth is for the most part, well concentrated, occurring in general near the mouth of the streams entering the St. Maries River. These bushes will run from small patches of 50 to 100 in some instances to as high as several thousand in others, depending upon the favorableness of the site. Among the brush species found on this area, a very confusing factor arises, in that, Ocean spray greatly resembles the sticky currant and will lead to a great deal of confusion should the area be eradicated.

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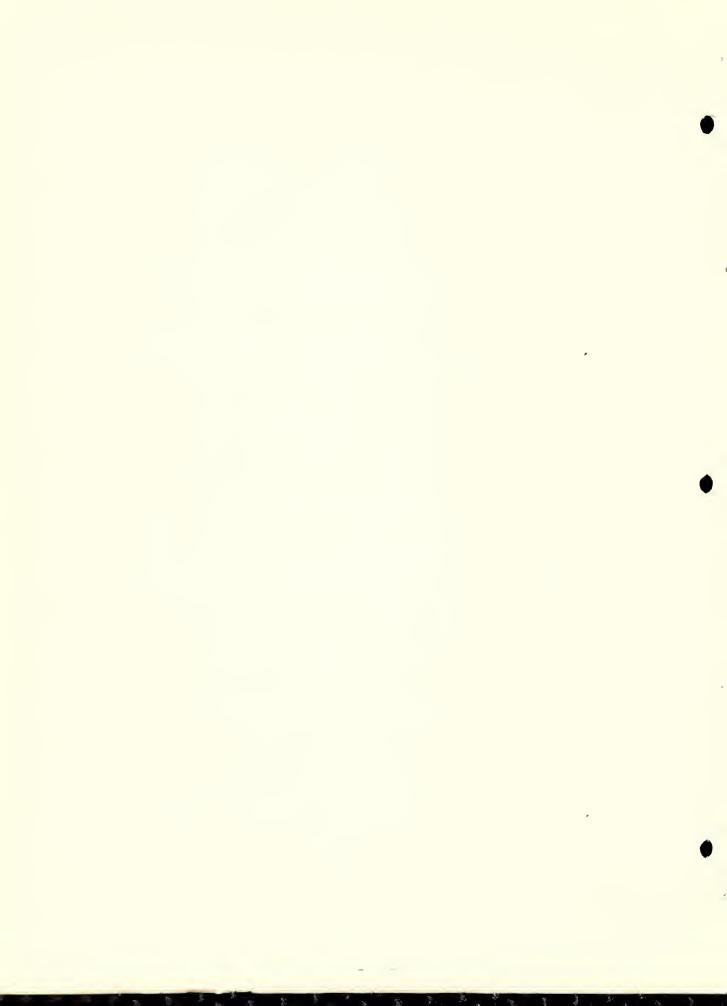
THE ST. MARIES RIVER DRAINAGE.

Comparative studies show that currants and gooseberries are almost completely absent, from the burns of 1919 and later years. A few scattered bushes were found in the 1919 burn on Tyson Creek. These bushes were of comparatively recent growth. This would seem to indicate that a period of several years is necessary after a severe fire to again allow the area to seed into currants and gooseberries.

Crystal Creek: One of the areas of most abundant growth was found on the St. Maries River. This area has been burned from 1 to 3 times. It is extremely doubtful if this area need be given further consideration, since the possibility of regeneration by other than artificial means are very remote. This area was originally an excellent white pine area. Soil, moisture and site conditions are exceptionally favorable to the growth of white pine. The area is covered by an extremely dense growth of fire weed, fern, ocean spray, and vine maple. This would make eradication prohibitive even if favorable reproduction were present.

Similar conditions are found on the head of the Mica Creek Drainage. This area was in the same logging unit so may be considered as having received the same treatment as the Crystal Creek area.

Sticky currant ranks first in importance on this area. It will run between 100 and 200 bushes per acre. The prickly currant being restricted to the more moist situation will perhaps run between 50 and 150 bushes per acre.



John Creek: Prickly currant is found scatteringly along the stream beds and moist draws. It will not average above 50 to 100 per acre. Sticky currant will average even less than this, and will not run above 30 to 50 bushes per acre. The principal difficulty in this area, in case of an eradication program, would be the density of the brush, some species of which strongly resemble the currants found on this area.

One item aside from the Blister Rust problem, but one which should be of great interest to the lumbermen, is the fact that both the larch and the white pine are suffering heavily from insect attack. The white pine bark beetle is doing considerable damage to isolated trees throughout a larger portion of the drainage. A small green plant aphid was noted generally distributed over the entire John Creek area. This particular pest causes either total or partial defoliation, among the younger trees. (Seedlings to trees of thirty years of age.) Just to what extent this damage may effect the present and future growth of white pine is a problem for the Entomologist to settle. General conclusions on this area will show, that it is almost ideal from the eradication standpoint. In no instance will either the current or the geoseberry exceed two hundred per acre. For the main part the bushes occur in more or loss restricted areas and the control work if carried along the stream and it's tributaries would virtually clear the area except for a few isolated bushes.

Charlie Creek: Prickly currant and white stemmed gooseberry on areas between Emida and Charlie Creek will average 50 to 100 bushes per acre along the creek. After the virgin timber is reached currants and gooseberries of all species are to all intents and purposes negligible. This bears out the observations made thus far that currant and gooseberry conditions within the stand itself are a great deal similar. In virgin timber, with the exceptions of the stream bottoms and natural openings, currants may be said to be non-existent. This is in all probability due to the fact that the dense crown canopy has given such complete shading to the forest floor that the bushes if ever established have since died out. This is born out by the fact that as a stand closes more dead stem is noted on the currant bushes until at complete closure the bushes die out.

St. Maries River, average conditions as found along the side drainages. The mouth of Tyson may be said to be typical of the majority of the streams entering the St. Maries River above the mouth of Santa Creek. A rather complete currant count was made and the following results noted: Black currants 50 per acre, fairly well scattered with no extremely high concentrations. Prickly currants will average 150 per acre, bushes large and confined to fairly dense growth in individual patches. White stemmed gooseberry will run 150 to 200 bushes per acre. It appears to be slightly more scattering than the prickly currant, but was invariably found to be closely associated with it. The white stemmed gooseberry except for the fruit is very easily confused with the prickly currant. The fact that the white stemmed gooseberry is far more susceptible to the disease than is the prickly currant, makes its detection an important phase in the control problem.

Another fact that the season's investigation brought to light, was that almost invariably the black current, which is the worst offender among the wild varieties, was found more than five hundred fect above the main forks of any side drainage. There are, however, exceptions to this rule. Emerald Creek and the main forks of the St. Maries River due to topographical and soil conditions far exceed this limit, but they are the exception rather than the rule.



Child's Basin: This basin represents a fine body of pine and gives a fair idea of average conditions in this region. This area thru almost complete shading has eliminated whatever current and gooseberry bushes that were originally on the ground. A few scattered bushes of prickly current were noted in natural openings along the stream. These almost without exception occurred on over-turned stumps and logs, which would lead the observer to believe that the seeds had been carried there by birds or squirrels. In general, the situation may be summed up in a similar manner as in other virgin stands, control measures need only be applied to the stream beds and adjacent area.

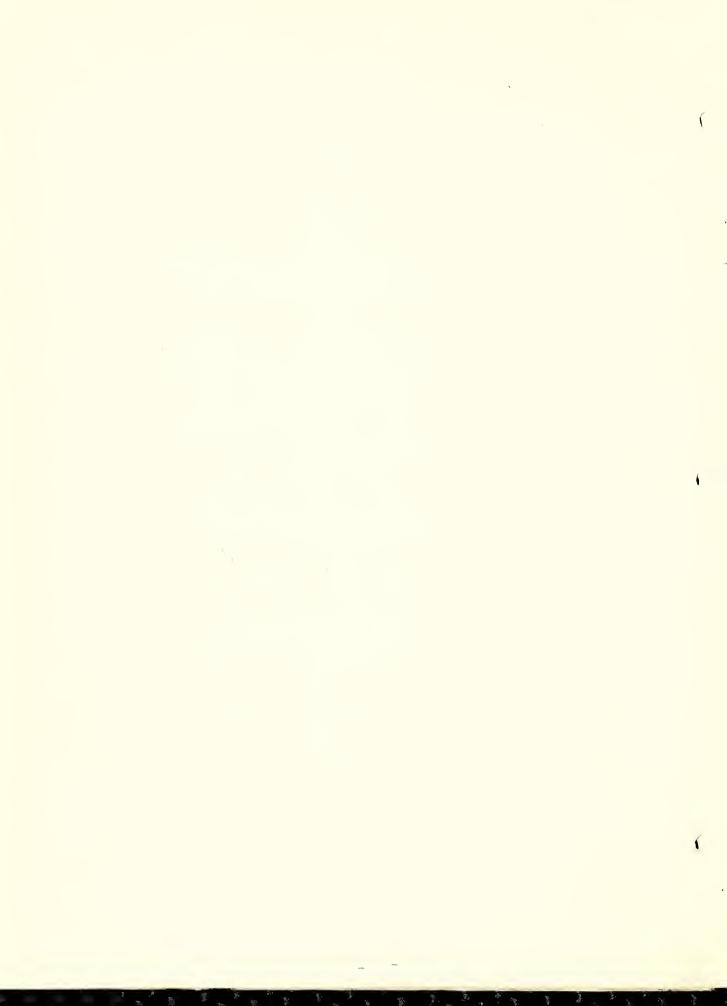
Middle Fork of the St. Maries River: Conditions of currants and goose-berries: (Sec's. 33,34,35,27,26, T.42 N., R.2 E., B.M.) Black currants are abundant, averaging 300 to 500 per acre along the streams. Black currants were noted as far as the south line of Section 26, and it is not known definitely if they are found above that point or not. The side drainages of the middle fork show heavy black currant growth but these do not in any instance exceed the 500 ft. maximum.

The heavy brush factors, alder and fern combined with semi-swamp conditions make this area a difficult one from an eradication standpoint. This area is unquestionably one of the most difficult encountered on the entire Association. Under the present system of eradication it would be entirely impossible to consider this particular locality with a view of removing these bushes. Prickly currant is found in considerable abundance altho it will not exceed 10 to 50 per acre on a general average.

Once again the virgin white pine proves itself to be almost completely free from currants and gooseberries. In a fourteen mile trip thru this timber only one small currant bush was noted, this combined with a low brush density factor, virtually eliminates this area from further consideration.

Currant Conditions: (Sec. 14, T. 43 N., R.1 E., B. M. adjacent to Jim Spur) A very good idea of average conditions can be guined from the data collected on a one-fourth acre circular plot in one of the older burns along the upper St. Maries River. In this area 194 currant bushes (sticky currant) were recorded. The currant bushes were in general very young but were making rapid growth and threatened to become the predominating brush on this area. The only point wherein this does not truly represent an average is the fact that under similar conditions prickly currant would replace the sticky currant to a greater or less degree. It is plainly self evident on the face of the data collected that unless a burn is restocking heavily to white pine it would be quite beyond the practical limits of the work to expect to eradicate such a burn.

In direct comparison to this area is the reproduction stand, located in the vicinity of Katz Spur (Sec. 19, T. 42 N., R. 2 E., B.M.) This stand represents an excellent growth of white pine associated with larch, white fir and lodge pole pine. Percentages will run roughly in the order named, the white pine taking the lead more on account of its extremely rapid growth than by the actual number of trees existing on this area. The age of this stand is roughly between 30 and 40 years. On this area forty bushes of prickly currant were found. These occur only in small groups in natural openings and along fallen trees and over turned stumps. Most of the bushes were very old and in almost every case the number of feet of dead stem found equaled or exceeded the amount of live stem now remaining. This would seem to indicate that as the stand grows older and



the crown canopy becomes more complete the bushes tho long established will gradually disappear. A very small percentage of the currant bushes found on this area were of recent origin and the total number will not exceed 150 bushes per acre, all species concerned. Further observation in the same locality bears out the general idea that the bushes will shade out if the stand is dense and uniform.

Currant conditions as found at high altitudes where there is an appreciable thinning out of the reproduction show an increased tendency towards heavier growth. Observations conducted along the old Bear Trap Trail show that there is an increased growth of prickly currant towards the heads of the draws and still higher up sticky currant replaces it. The bushes in this locality will probably run on an average of 100 per acre at the lower elevations to as high as 300 per acre along the tops of the ridges.

Upper Drainages of the St. Maries River: Black currant conditions. The extremely rank growth found on the more favorable growing places of the wild black currant is best shown by the results obtained on a sample plot on the south fork of the St. Maries River. The bushes are computed on the basis of an acre and the results as tabulated are a fair indicator of what is to be expected under similar conditions.

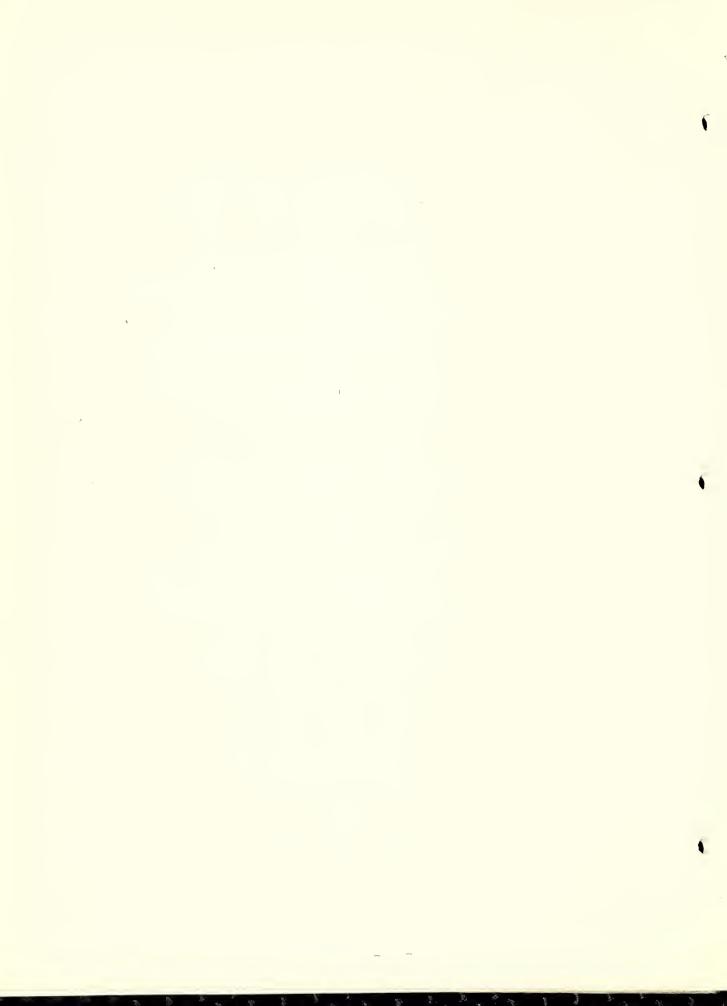
- 1. Wild black current 14,170 per acre.
- 2. Prickly currant 1,526 per acre.

Total for both species 15,696 per acre. This of course must not be construed to mean that wherever black currant growth is found such conditions of rank growth will exist. This however is well representative of the dense currant matts which are characteristic of the upper portion of the St. Maries River.

Emerald Creek: Further investigation was carried on in the mature white pine stand on the West fork of Emerald Creek. These observations in a large measure seem to bear out the general idea that the eradication program in virgin timber really simmers down to the removal of the bushes along the stream bed. The only bushes noted on this area, that is within the boundaries of the matured stand were in small open spaces where optimum, light and moisture conditions prevailed.

Wild black currant was noted well beyond the 500 ft. maximum which usually marks their limits in side drainages. Emerald Creek may be said to be an exception in that the stream gradient is so slight that soil and moisture conditions do not change appreciably for a considerable distance. This stream and the fork of the St. Maries River already referred to were the only exceptions noted on the entire Association. The bushes along the stream do not show a high concentration but are extremely scattering and will not exceed on an average, 50 to 75 bushes per acre from the mouth of Emerald Creek to their upper limits of growth.

Prickly currant is much more numerous on the lower west fork than is the wild black currant. The majority of these bushes are very old and show that they have been established for a long period of years. Similar conditions are found along the east fork of Emerald Creek, and on both forks the wild black currant was found to reach more than one half mile up either fork.



Further data on burned over areas was obtained in an old burn on Sunset Peak, results may be tabulated as follows:

On a one-fourth acre circular plot prickly current totaled 112 per acre. The majority of the bushes were young altho there were many older bushes on the area. Sticky current, due to the elevation and drier site conditions, greatly exceeded the number of bushes of prickly current found. The total number was 392 per acre. The same general growth was found in this current as was found in the prickly current, the larger majority of the bushes being comparatively young and the next heaviest growth was in the extremely old age class.

St. Maries River between Fernwood and Clarkia, Idaho: General observations of currant and gooseberry conditions. Wild black currant occurs scatteringly along the river bank, the bushes running from 10 to 50 per acre. The majority of them are old and have been long established. Prickly currant appears more promising. It will average 50 to 100 per acre and in this case also the bushes fall in the older age classes. These conditions may be said to hold good for one to three chains on each side of the river, varying with the distance to the more abrupt slopes.

Conditions in an old cutting near Metropolitan Spur were tabulated as follows:

Wild black current and sticky current will average from 50 to 100 per acre. On this particular area wild black current was noted growing on a comparatively dry situation. This was the only portion of the Association where a black current was found other than in swampy or semi-swampy conditions.

North fork of the St. Maries River: Currant conditions along the north fork of the St. Maries River to the Mouth of the Merry Creek and for a short distance up the Merry Creek drainage. (Sec. 5, 6, 8, T.42 N., R.2 E., B.M.) Along the main stream wild black currant and the prickly currant were found. The number of bushes were approximately the same as found on the middle fork. Prickly currant would perhaps not run as heavily in the adjacent stands of timber and will not exceed 10 to 50 bushes per acre.

Wild black currant was found for a considerable distance up the side drainage of Merry Creek. It undoubtedly extends for a considerable distance above the point of observation, which was about one half mile. The bushes will average 500 per acre, along the portion covered. There is little hope for this area unless chemical eradication can be developed to handle this case. The surrounding white pine could not possibly bear the cost of eradication under the present system. Further observation shows that at greater distances into the timber there is a marked thinning out of currant growth. Sticky currant and prickly currant are present in about an equal number and will run 10 to 20 per acre.

Cedar Creek: General observations. Prickly currant is very scattered averaging 10 to 50 per acre. No wild black currants were noted. Further up on this drainage 12 large bushes of wild black currant were noted. Between Cedar Creek and Emerald Creek there was a marked increase in both the wild black currant and prickly currant growth. There was no apparent reason for this increase as soil, moisture and shade conditions remained very nearly constant. The following results show that prickly currant will run 50 to 100 per acre, wild black currant 50 to 100 per acre. Here again we find the wild black currant growing in extremely dense masses under semi-swamp conditions.

()

Observations along the Clarkia-Bovill road, in an open white pine stand a strip 4 chains long and 1 chain wide was taken. An attempt was made to have this strip represent as far as possible average conditions. On this strip 32 sticky current bushes, and 5 prickly current bushes were found. This will run slightly higher than the general average in mature white pine stands. The reason for this is that the stand was much more open than those ordinarily found. This would give the current and gooseberries more than ordinary growth conditions.

Bectels Butte: Condition in an old burn. In this burn which must have occurred between 10 and 15 years ago no current or gooseberry bushes were found. The only place that bushes were noted was on areas immediately adjacent to the stream bank. Two small matts of wild black currants were found and a few bushes of prickly currant, not to exceed 15 or 20 in all.

III.

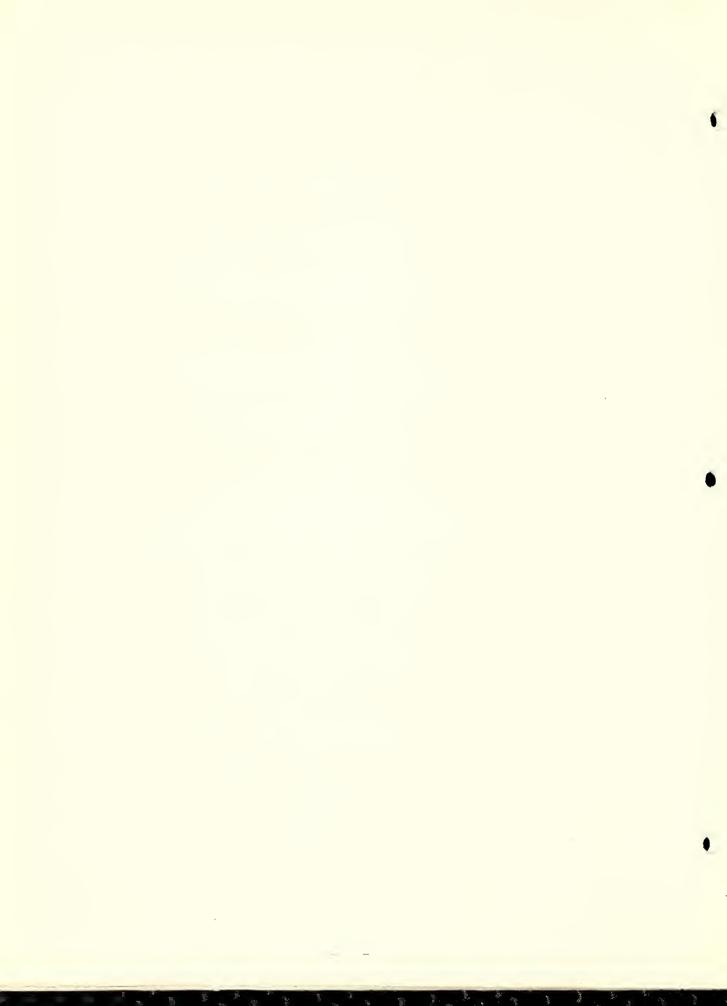
ST. JOE RIVER DRAINAGE.

The 1910 burn in northern Idaho is extremely hard to classify, due to the diversified conditions and the vast area of this burn. The data collected represents average conditions on the more completely devastated areas. The bulk of the burn may to all practical purpose be considered as waste land. It is a problem not of protection, but of reforestation and enters into the problem of blister rust, only in so far as it affects the adjacent white pine area. Currant conditions in this burn vary widely from almost total absence to 300 or more bushes per acre. White pine is almost without exception lacking in sufficient quantities to justify control measures.

Rochat Creek: The area included in the Rochat Creek drainage may be considered as representing a fair average of conditions in general. Along the stream bed, prickly current was found more or less scattered, 50 to 100 bushes per acre. The majority of the bushes were very young and appeared to have come in since the 1910 fire. Sticky current appears prominently thruout the area, ranging from the creek bottom to the tops of the secondary ridges. Many of these bushes judging by their size must have escaped the 1910 fire or else they have shown almost unprecedented growth. These bushes will run 250 to 300 per acre.

Marble Creek burned over area: The Marble Creek area is greatly similar to the 1910 burn on the upper St. Joe River. Reproduction areas are only found in small spots that by chance have escaped the repeated fires of the last few years. In a great many instances the burn is too recent to draw any conclusions as to what its status will be in years to come. The major portion of this area may however be considered as a part of the great American desert. There is little hope of satisfactorily restocking by other than artificial means.

Currant conditions in Marble Creek, in the vicinity of the Rutledge Timber Camp No. 7. Very heavy sticky currant growth was noted in this burn. The bushes will run 150 to 200 per acre. Prickly currant appears somewhat less abundant, 100 to 150 bushes per acre. On a similar area including a portion of Eagle Creek and Davaggio Creek the currant conditions change somewhat. Sticky currant almost totally replaces the prickly currant except for the more moist situation adjacent to the streams themselves.



Taking all things into consideration the more severe burns regardless of their age, may be almost completely eliminated from a Blister Rust program under existing economic conditions. They will, however, prove to be a decided factor where their boundaries extend to valuable white pine timber. In practically all of the old burns currents and gooseberries have taken advantage of the increased light and in some cases of the moisture conditions, and as a result their growth has been extremely heavy.

Observations on Upper Trout Creek. The larger portion of this area is included within the boundaries of a burn that appears to be about 15 years old. The current varieties found here are the same as those in the 1910 burn on Rochat Creek, as there is little if any reproduction present on the area. Sticky current will run about 100 per acre and prickly current 50 to 75 per acre.

The virgin timber on Trout Creek is practically free from currants. This combined with the fact that white pine in general does not appear until well beyond the 900 ft. limit along the main drainages and side drainages, affords almost natural protection.

The white pine beetle and the white pine butterfly have taken an exceptionally heavy toll on this drainage. In several instances patches of virgin timber, several acres in extent, were found to have been completely destroyed. The infestation seems to be spreading slowly from these areas and is taking an isolated tree here and there. Should a favorable year come about, this entire area of white pine might be virtually destroyed, as the beetle is well established.

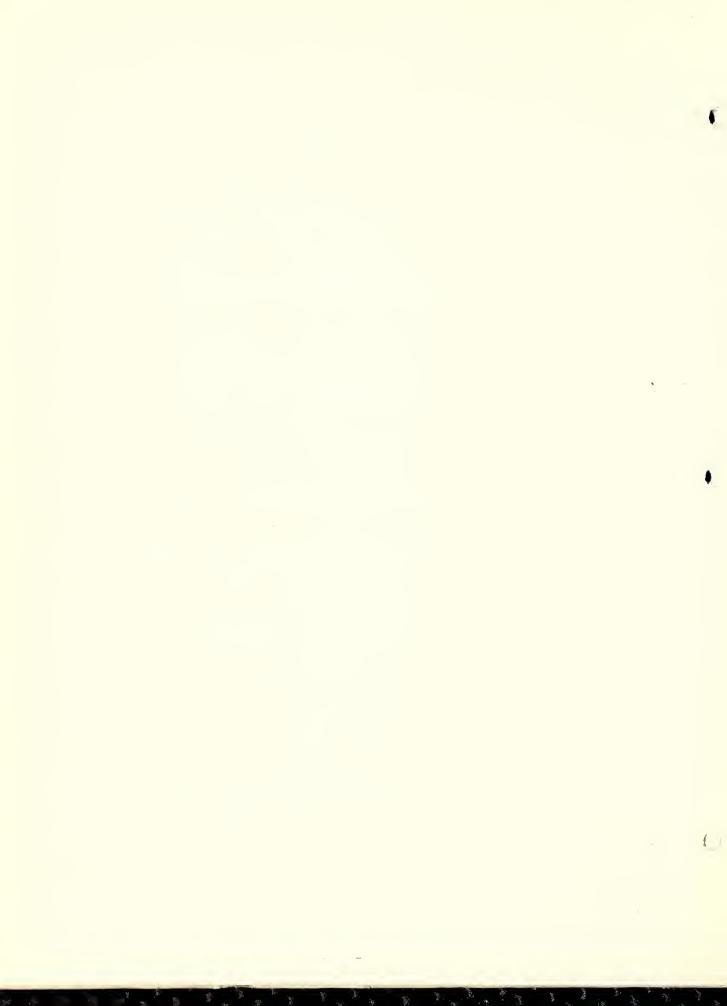
IV.

THE COEUR D'ALENE RIVER AND ITS TRIBUTARIES.

Data on the following sections (Sec. 4,5,8,9, T. 51 N., R.1 E., B.M.) Prickly current will run 50 to 100 per acre with the age classes well distributed. Prickly current occurs in the draws and in the more moist and open situations. It will run 10 to 30 bushes per acre.

A check on the currant conditions in the 1910 burn on the Coeur d'Alene River shows that along the streams prickly currant will run 50 to 100 per acre, white stemmed gooseberry 10 to 50 per acre and sticky currant along the streams and at higher elevations, 50 to 150 per acre.

Independence Creek, (Sec.23,24,26 T.53N., R.2 E.) Prickly currant is extremely heavy along the creek. In this particular locality they will run 800 to 1500 bushes per acre. All timber of commercial value lies in a belt adjacent to the creek. The greatest distance on either side of the drainage where good commercial timber is still found will not exceed 20 chains. In order to protect this area, currants would have to be removed from slightly over one-half the distance thru the timber in question. This timber includes one of the heaviest areas of currant growth found on the Coeur d'Alene River. The cost of removal of these bushes would in all probabilities exceed the stumpage value of the white pine. Currants within the main stand itself are practically negligible, the entire problem centering on the heavy concentration along the main drainage.



Lower Independence and Emerson Creeks: General observations. In this area there is little if any white pine, the main stand consisting of red fir, larch and white fir. Currants and gooseberries will run slightly heavier than average. This is accounted for by the fact that the character of this stand is more or less open.

Yellow Dog Creek: General notes. Prickly currant is the only species found on the area. They will average 50 to 100 per acre. The white pine is the finest immature stand found on the Coeur d'Alene drainage. It is between 50 'and 80 years old.

<u>Downey Creek:</u> This drainage contains a stand exactly like that found on the Yellow Dog Drainage. Again the only species of currant encountered is the prickly variety, which will run 50 to 100 per acre.

Coeur d'Alene River in the locality of Enaville: The greater majority of the territory immediately surrounding the town of Enaville may be omitted from consideration. There is very little white pine and such as there is, is of poor growth and it is not probable that it will ever have any commercial importance.

Little North Fork of the Coeur d'Alene River: Almost the entire drainage is the white pine type or contains sufficient white pine to justify considerable additional study. Due to lack of time this area could not be given a thorough study and consequently the notes here are more or less sketchy. Currants and gooseberries in general will not exceed 100 to 150 per acre, and over a larger portion of the territory they will not exceed 50 to 75 per acre.

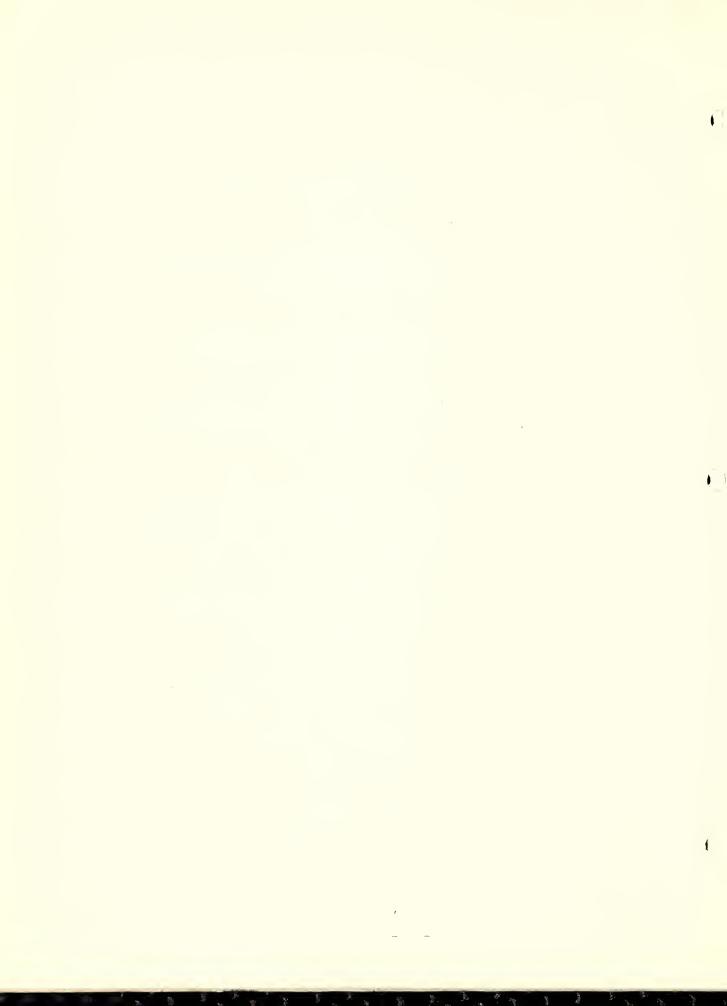
Honeysuckle Ranger Station to Cascade Creek: Excellent stand of young white pine, a large amount of the reproduction 8 to 10 years old. Currants and gooseberries 50 to 100 bushes per acre.

South Fork of Coeur d'Alene River: White pine very badly scattered, currant growth very much heavier. Prickly currant 50 to 100 per acre. Sticky currant 50 to 75 per acre.

SUMMARY

In summing up the situation as a whole, in mature stands wherein the white pine is present in sufficient amounts to be of commercial importance, very few currants and gooseberries are found. Control measures under such conditions, would be confined to the area immediately adjacent to the stream. Mature stands which are within the boundaries of the older burns and have such burns as their limits will call for eradication along the edge of the burn.

In the case of the burned over areas themselves it is impossible to give more than a tentative idea. They may come back or they may not, depending on the treatment that they receive. Burns of recent date (1919 and later) do not show indications one way or the other and must be left to the future for classification. In the older areas the burn is either restocking or has become a permanent waste. If it is restocking satisfactorily, currant conditions are generally such as to warrant a detailed investigation and in the majority of the cases local control.



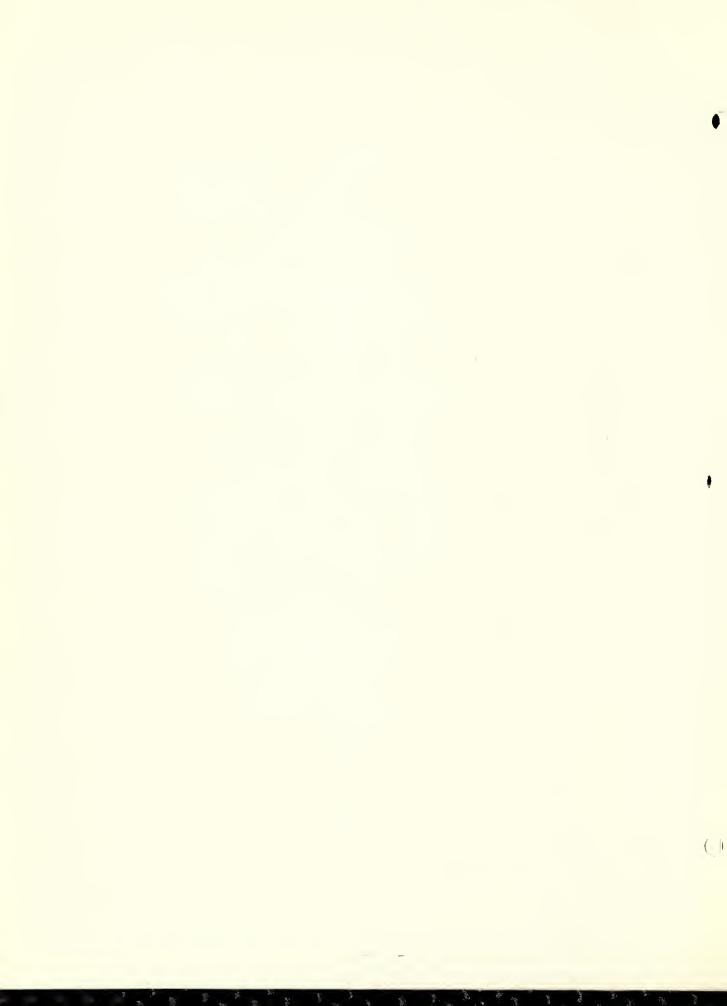
The devastated areas automatically classify themselves. They are non-producers and the only way that they have any bearing, is on the adjacent pine stands. In the majority of the cases noted they contain the greatest number of currant bushes per acre and will increase the cost of protection where ever they come in contact with good white pine timber.

Reproduction areas show similar tendencies to those of virgin stands. Where growth is good and the stand is comparatively dense and uniform, currants and gooseberries are only found in the more favorable growing conditions. Such areas in view of their future yield will certainly bear the cost of protection.

Reproduction area, where white pine is scattered or where the stand is patchy cannot be considered because the ultimate profits are not large enough to justify the initial expense of removing a large number of bushes from such territory.

If the work is worth doing it is worth further investigation. Either it is a problem that must be taken seriously and backed as such, or eliminated entirely.

There is no doubt as to the damage caused by white pine blister rust and its appearance in northern Idaho is a certainty within a short period of years. If the disease is to be combated successfully, there must be on hand complete and accurate information, otherwise time and money will be wasted on unprofitable areas.



PROJECT 4 FIELD STUDIES AND COLLECTION OF FIELD DATA

At the present stage of western blister rust work, this projec t covers all work on the spread of the rust, infection and damage to pine, and the compilation and presentation to the public of all information on such matters.

(4.1) Progressive Spread of Rust

Scouting to determine the progressive spread of the rust was carried on in conjunction with the cultivated black current eradication. The fact was recognized that the best opportunity of finding the rust, if present in a community was afforded by a thorough inspection of all cultivated black currents as found. The cultivated black current eradication work was therefore planned to permit and require careful inspection of these plants, and working plans were so arranged that such work was carried on in regions where the rust was most to be expected at times late in the working season. Also, numerous native Ribes were carefully inspected during the latter part of the season. No evidence of the rust was found in Montana, Idaho, eastern Washington, Oregon or California.

During October, 1924, a special crew of 4 men was put into western Washington, to determine the progress of the rust in that region. This scouting was conducted in 11 southwestern counties. Infection was found in 5 of these counties, at 25 points. The following table gives the results of this work.

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Scouting in Western Washington TABLE XLIX

Total	Jefferson	Kitsap	King	Pierce	Mason	Grays Harbor	Thurston	Pacific	Lewis	Cowlitz	Clarke	Coun ty
100	20	27	N	9	31	35	18	16		15	+	Total: No. of inspection ppoints
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1.73.		1: 7:						00	28	24	6	Scouting i R. : R. : vulgare:re : Not: nf:Inf::Ir
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Scouting in Western Tashington

The results of the scouting in Okanogan County are given in the following table.

TABLE L

The second section is a second	:No. of	:Total No. of	:
Species of Ribes		: Plants	: Infections
CONSTRUCTION OF THE PROPERTY O	: Points	:Inspected	
R. nigrum	: 30	,: 434	: 0
	1	:	:
R. petiolare	: 13	: 369	: 0
n 1 t	6	:	0
R. lacustre	•	: 152	: 0
R. viscosissimum	2	11	: 0
N. VISCOSISSIMUM	• 6.	• 77	•
R. cereum	8	107	. 0
210			8
R. vulgare	: 5	: 39	: 0
		:	•
G. inemis	: 9	: 273	; 0
	*	•	•
G. reclinata	: 3	: 65	: 0
	:	31.50	:
Total	: 76	: 1450	; 0

(4.2) Damage to Pine

Progress Report Control Demonstration Area Cheekye. B.C.

During the spring of 1923 a Control Demonstration Plot was established at Cheekye, B.C. It had for its purpose the determination of distance of spread of blister rust from Ribes to white pine under western conditions.

This report covers the progress made in the work in 1924. A detailed discussion of what was accomplished in 1923 is given on page 4 of the Annual Report of the Spokane Branch Office of Blister Rust Control. It will only be necessary to give here a brief statement of the work done previous to 1924, which may be considered as 4 phases as follows:

l. Surveying Area: In late April, 1923 a plot circular in outline, having a radius of 1250 feet, was surveyed. The area had been cut and burned over possibly 15 or 20 years previous. Ribes species and Pinus monticola, seedlings and poles, were abundant. There was a heavy and well distributed infection of blister rust.

ALEX XIX SISAN actions and Saltaeos

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The results of the scouting in Okanogan County are given in the following table.

TABLE L

Species of Ribes R. nigrum	No. of Inspection Points 30	:Total No. of : Plants :Inspected ;: 434	: Infections
R. petiolare	13	: 369	0
R. lacustre	6	: 152	0
R. viscosissimum	2	: 11	0
R. cereum	8	107	0
R. vulgare	5	39	0
G. inermis	9	273	0
G. reclinata	3	65	0
Total	76	1450	0

(4.2) Damage to Pine

Progress Report Control Demonstration Area Cheekye, B.C.

During the spring of 1923 a Control Demonstration Plot was established at Cheekye, B.C. It had for its purpose the determination of distance of spread of blister rust from Ribes to white pine under western conditions.

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1. Surveying Area: In late April, 1923 a plot circular in outline, having a radius of 1250 feet, was surveyed. The area had been cut and burned over possibly 15 or 20 years previous. Ribes species and Pinus monticola, seedlings and poles, were abundant. There was a heavy and well distributed infection of blister rust.

The results of the scouting in Okano an County are given in the following table.

J SJEAT

Infections	:Total Mo. of Pleats:		Speries of Ribes
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0	152	9	R. lacustre
0 :	: 13	S	R. viscosiesinum
0	107	8	R. cereum
0	9.5	5	R. vulgere
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(4,2) Damege to Pine

Progress Peport Control Demonstration Area Checkye, F.O.

During the opring of 1923 a Control Demonstration Plot was established at Checaye, T.C. It had for its our one the determination of distance of spread of blister must from Ribes to white pine under weatern conditions.

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- 2. Eradication of Ribes: The Ribes were eradicated by crews of men, each consisting of five men in line spaced 5 or 6 feet apart, and a foreman and checker back of the line. The Plot was covered three times in this manner. Table 53 shows the results.
- 3. White Pine Planting: Two year P. monticola transplants from Wind River Forest Service Experiment Station were planted on eight radii, three rows to a radius. The distance between rows, and the spacing between pines in each row, was six feet. The planting was done on May 10, 1923, when planting conditions were exceptionally good. Considerable moisture fell thruout the growing season. It is shown in Table 57 that nearly 88% of the pines were alive in May, 1924.
- 4. Patrollery for Fire: During the summer of 1923 one man was employed to patrol the area for fire, and to work on the plot in spare time, cleaning out around pines, etc.

Work Done in 1924

The study was continued along the general lines enumerated above and will be discussed according to the following headings:

- 1. Inspection of plot for Ribes missed in 1923.
- 2. Replacement of planted pines which had died.
- 3. Patrol of area for fire.
- 4. Inspection of planted pines for evidence of blister rust.
- 5. Analysis of infection of native pines on the plot.
- 6. Topographic survey of Cheekye region.
 - 1. Inspection of Plot for Ribes
 Missed in 1923.

In May, 1924 the plot was rechecked for Ribes missed in 1923. A crew of 3 or 4 men in line, spaced 8 to 10 feet apart went back and forth over the area by octants in a direction parallel to the circumference. This method was used in order to approach missed Ribes by a different direction from that taken in 1923. Tables 51 to 56 and Map of Cheekye show what was found.

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 - 3. Petrol of eres for fire.
- 4. Inspection of planter pines for evidence of blitter rust.
 - 5. Analysis of infection of native pines on the plot.
 - 6. Topographic survey of Cheekye region.
 - 1. Inspection of Plat for Ribes Missed in 1923.

In May, 1924 the plot was rechecked for Ribes missed in 1923. A crew of 3 or 4 men in line, spaced 8 to 10 feet apart went back and forth over the area by octants in a direction parallel to the circumference. This method was used in order to approach missed Ribes by a different direction from that taken in 1927. Tables 51 to 56 and Map of Checkye show what was found.

						1924				
Oct	; ;-:	:	:	: Date	Found	l:	G	of Ssag		
		:	: Location	: : Rt.	:L.S.	: Ht.	1 L. S.	: 19	: L. S.	: Remarke
F ↔N	1	:516/24	:25 Ft.at rt.anglss :of N.8°E	: 1.3	:1.3	:1,2	:1.2	:	:	: On rock. Portion of root of bash : pulled 1923. : Broken off portion of bush pulled in 1923.
	R.lac.	:5/7/24	:30 fest at rt.angles :from N 22 E	: •)	0		: •)	:	: —	:Un ROCKY Hill. These found within 2 feet of
	1	*	:	; , <u>1</u>	; .1	1	:	:	:	sech other. Evidently bush imperfectly
	:R.lec.	:5/7/24	COU LEGE ST LIGHTS 168	: 46"): -			7:		:Rroksn off portion of bush pulled in 1923. :Seedling) Remains of bush
	:	1	ifrom N 20 E	· .25	· •25	: .2	: .2	:	:	:Sesdling) pulled in 1923.
	· 	:	:75 fest at rt.anglee :from N 22°E	: •5	: •75 : •7	: •4	: .6	: .2	: •3)	:Under pile of pulled bushes. Fell off and
	:R.lec.	:	:80 feet at rt.angles :from N 33°E	: 1,2 :	:1.7	:1.1 :	:1.4	: •7	:1.0	On Rocks. Missed bush 1923. in hole.
	:R.lac.	:	:120 fsst rt. anglss :from N 24°E	:	:	:	:	1	2	Old piecs of root not pulled. Dead branch bsyond. 4 small lseves 1/3 inch in diamoter
	: R. sang.	:5/8/24	: 126 fsot rt. englss	-3	: .3	2	: -2	:	:	Growing on rocks, west slops. Foot of small hill. From broken off stem,
	R. ceng.	:5/9/24	:from N 22°E	7	: .7	, li	: : 4	<u> </u>	: .1	1923. Thres lsaves. Bush missed, 1923. Just south of Laks Alice
<u>ن</u>	1	•	:I TOWN N SS R		: :		:	:	: :	:Treil.
186-	: Ralaca	15/9/24	from N 21.5°E	1.5	8-0	1.4	175	1 2		mattock. Near trail. Ridden by Douglas Fir tree four feet tell,
	:	i	OT ON NE RECTUE		: : :		:	•		Missed buch 1927
	•	•	:30 fest rt. angles :	1.2	:6.0 :	1.0	:5.0	8	3.5	Missed busb, 1923.
	R. sang.	10/11/24	: 33 fset rt. angles :	• 3	•3	•3	• 3		≈	No growth 1924. Growing in open near
	R. sang.	:10/20/24	: 100 feet NW of 142 : Chains on NE Radius :	•7	.7	3	?	?	7	brueh clump. Missed bush. 3 years old. No infection on leaves. Prob-
 NB→E	R. Seng.	2					7.0			ication. In open space. Growing emong alder branches. SW side of
	R. eeng.	:5/10/24	68 NE Radius	1.5	1.5	1 E	1.6	3):	10,0	trse. Missed, 1923. Growing among vins maples in shede. N.sids
	Reces	15/11/01	from N 80°E) (e.c.)	4.7	-• 7 S		7.0	11 0	Growing among vins maples in shade. N.sids of tree. Missed bush.
	·	<u>: </u>	Trom N 50°E	:	:			: :	:	Growing with wild cherry tree of eame height. Missed bush, 1923.
	:	: :	from N 74 E	•				• •	•75:	On mineral soil under upturned stump. Six
	R. lac.	:5/11/24 :	185 feet SE of 14 : chains on NE Radius :	•9 :	2.8:	.8::	2.5	.6 :	1.5 :	North of and under alder in midst of castellia. Misssd bush.
	R. seng.	15/13/24:	12 fest rt. angles : from S 89°E :	•7:	•7:	.l.	. <u>h</u>	.2 :	.2:	5 leaves) One find. Missed bushes under 5 leaves) log. Probably wall scrssnad
;	P. seng.	::	8 feet rt. angles :	•3:	•3:	.25:	.25:	.1 :	.1 :	3 leaves) with bracken ferns. Three leaves. Missed bush. Fairly open,
;		::	from S 87°E : 65 feet S of 16 Pine;	:	1.0 :	:	:	:		nsar Rubus.
:	R. eang.	: :	on E Radius :	.6:	1.1:	.4:	•7:	;	:	3 small shoots-root left in 123. West
	R. sang.	:5/13/24 :	85 fsst S of 16 Pine:	.6	1.2 :	.4:	.g	:	:	Shoots growing from bush apparently dead at
:			on E Radius :	:	:	:	:	:	:	tims of eradication. Screened at base of cottonwood. Dead stem 1.6 feet beyond shoot.
•	R. sang.		80 feet rt. englee :	•3:	•3:	.2:	.2 :	-:	:	Total dsed stem of bush 2.5. Open. Small shoot growing from root laft
		:5/14/24 :	from S 80°E :		15:				.2 :	in 1923.)One find. Missad in 1923. Open three
:	R. seng.	: :	50 on SE Radius :	•3:	.8:	.2:	.2 :	:	:)sidss. Partly sheltered by small logs.)Dsad bracken currounding Ribes.
:	R.seng.		120 fest S of 15 : Chains on E Radius :	.4; :	.4 : : :	•B:	,B : :	: :		Shoot growing from root not pulled in 1923.
	R.eang.	:5/14/24	210 fset NE of Pine : 60 on SE Radius		•2:		.1	- :	:	Grown sincs '23.) Ons find.
;	Reseng.	1 :	:	•5 :	•5 :	.4	.4	. 2 :	.2 :	Missed, '23.)log and
:	Reseng.	:		.6	.6;	.4 ;	.4	: .2 :	.2:	Missed, '23.)bstwssn Missed, '23.)log
:	R. sang.	: :		•5 :	•5:	∗ 3 :	• 3	: :	- :	Grown from root not pulled, '23.) and Missed. '23. Almost dead.) vince
:	R. seng.	:		.2 :	.2:	.1 :	.1:		:	Missed, '23.)maple. Grown from root not pulled, '33.)
;		:5/14/24 :	175 fest NE of 13 :	.2 :	.2 :	.1 ;	.1	:	6	Grown from root not pulled, 23.) Grown from root not pulled, 23.) One find.
;	R. seng.	: :		.4 :	.4:	.2 :	.2		:	n n n n n h) two ssed-
;	R. sang.	: :	:	.2 :	.6 :	.1 :	.3	- - :	: :	" " " " ")lings these
;	R. seng.	:			1.4 :				:	n n n n n h)all shoots
:	R.seng.	: :		;	.8:	:	;		•3:	Missed '23. Heavily scresned) remaining under log. Two leaves) in ground
	R. sang.	: :			•5:	.4 :	·π	.2	.2:	Missed '23. Reavily screened)when bush under log.
	R. sang.	: 3	220.6	.2 :	.2:	.1:	.1		•	Crown from mach mak walled tor lie tor
:		15/14/24 : : :	210 feet NE of 71 : Pine on SE Radius :							Ons find. Shoots from roots left when
-	R. sang.	7.	235 fest NE of 72 :	•3:	.3:	.1 :	. 2 :	:	:	Dehind small log. Slightly acreened
:		<u>:</u> :	Pins on SE Radius :					:		bracken fern.
:		1 1	245 feet NE of 72 : Pine on SE Radius :			:	•9		:3	3 ehoots from root not pulled 1923. Broken off above ground. Open.
		:5/15/24 :	30 fest NE of 116 : Pine on SE Radius	1.0:			1.7		1.2 \$M	hiesed bush la fset sast of balm of gilead.
1		5/15/24	10 fest NE of 175 : Pinc on SE Radius :	1.0 :	1.1		1.5 :		L.O 11	issed bush. Growing low on sround among
		:5/16/24 ;	90 feet E of 13 :	.4:	.4	.3:	•3	.1 :	.1 :N	issed bush growing under small log in grass.
S-Si7:	R. sang	:5/22/24 :	396 feet west of 15 :	4.3 :	11.04	.2 :1	0.0	7 .6	0 11	Inhsalthy bush. Six legves. liesed bushes. Bstween two willows 8 feet call. Open on S side. Visiblt from NE and
;		:			L J	•			; S	o No reason for missing, 1923. Largs
SW-W:	R. lac	5/21/24	75 fsst rt. engles : from S 84°W	1.4:	6.0.	- :	;	:	:)	Remains of old bush pulled 1923. Evidently fallsn on ground and taken root from
			:	- ()	70%	:		:	:)	stems. Near log. Four leaves
:	Reena	5/21/2	275 fsst S.of 62		.2	-:	:	:	:)	infected showing uredinia no tslia.
:	R. eang.		Pine on W Redius.	_ :	24	2		:	: i	iseed bush growing under small hemlock and n blackberry bushss.
<u>:</u>			Chaine on SW Radine:	:		:	:	:	:	issed bush, 1923. Growing in open
1 1211	n reesing		Pins on W Radius	•5 :		:	:	:	:P	emaine of old bush pullsd '23.)Ons location ortion of buried stem)Remaine of
	II M		4	•3:	•3	.2:	.2:	:	:N :P	ew"Rush"missed 1925.)old bush fortion of buried stem.)pulled 1923
	11 11	:	•	•4:	8	: :	-:	:	:	u u u)and etarting u)up again from
:	ti II		•	•3:	. 3/	.1 :	.1	:	: '	sw"bush"missed 1925.)stems left or)fellen on
				.4:	•9:	;	;	;	:P	ortion of buried stem.)ground. Soms)new sssdlings
. <u>:</u>	70.44	: :	60.65-1-	:			:	:	;) as listed. in blackberry bushs
	m. asug.	: 121/24	60 fest R of Pine 115 W Radius	.6:	.6:	3	.3:	.2 :	.2 :	5 Isaves showing. Missed bush 1923. Under birch in blackberry vines.

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In order to properly enalyze the data in Table 51 from different view points, it is necessary to construct several tables based on Table 51. Tables 52, 53, 54, 55, 56 are derived chiefly from Table 51.

Certain points may be observed from Table 51.

- l. The largest Ribes found was a R. sanguineum located in the S-SW octant, 4.3 feet tall with 11 feet of live stem. If any reason can be given for the fact that this bush was overlooked on three successive occasions by the eradication crews in 1923, it is that it was located between two willows 8 feet tall, and that the foliage of the two species intermingled to a slight degree.
- 2. The smallest Ribes found was a R. lacustre, .1 foot tall, sprout growing from a root left from a bush imperfectly pulled in 1923. This was located near the circumference in the N-NE octant.

Table 52 gives a total of the Ribes found in 1924 by octants:

TABLE LII Total Ribes Found, 1924, by Octants. Octant: Ribes: Number: Number: Total Feet : Average No. :Average Ft. Live :Species :Locations:Bushes:Live Stem :Bushes per :Stem per bush :Location :R.sang. : 6 : 9.0 :1.0 :16.6 :1.6 :R.lac. : 8 19: :R.sang. : 3 :R.bract.: 1 : 3 :14.5 :1.0 : 1 : 1.0 : 1.0 :1.0 :R.lac. : 1 : 2.8 :1.0 :Total :23.8 :39 E-SE : R. sang. 113 :3.0 :1.0 :R.lac. 40: 25.5: .4: 1: 1.0 SE-S :R. sang. : :R.sang. : SW-W : R. sang. : 2 : 5 : 3.0 :1,0 : 1.5 :R.lac. : 1 :10.1 :5.0 13.1: 7: 2: 5.3: W-NW :R. sang. : 9: None : None : None :62 :69.8 Total :R. sang. :28 :2.2 : 1.13 :R.lac. :11 :20 :31.2 :1.8 : 1.56 : 1 : 1.0 Area : R. bract.: 1 :1.0 Grand 83: 102.0:

In order to properly englyze the date in Table 51 from different view points, it is necessary to construct several tables based on Table 51. Tables 52, 53, 54, 55, 56 are derived chiefly from Table 51.

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Mable 52 gives a total of the Ribes found in 1924 by octants:

III EJJAT Total Ribes Found, 1924, by Octants. Octent: Ribes: Number: Number: Total Feet : Average Mo. : Average Ft. Live :Stem per bush :Bushes per :Species : Locations: Bushes: Live Stem :Location 0.1: 0.8: 9: : 1.5 :R.song. : 6 : R. lec. : 8 :16.6 :13 : 6.75 : IstoT: 1 3 :R.sang. : 3 0.1: 3.4I: 0.1: 0.1: 0.1: I : F. bract.: 1 8.3: : Total : :23.3 6£: 0.5: :R. sang. 117 d's : R.lec. : 1 :01 IstoT: : [M. : 11. 0.1 : P. song. A: B. Pener. : 13.8: : 1.5 0.I: S : f.Cf: 13.1: :5 : 5 : F.geng.: :0 Wone NW-N: None: : элох Mone : None : SHOW :69.8 : 1.13 Sd: Total : H. Feng. : 28 S.S: S. IE: OS: : R. lac. :11 : L.50 :1.8 Area : R. brect.: 1 : 1 : 1 : 83 : O.I: :1:1.0

An examination of Table 52 shows the following conditions:

- 1. By far the greater number of Ribes found in 1924 occurred in the eastern half of the area. 85% of the total Ribes locations; 78% of the total Ribes bushes; and 68% of the total live stem was found in the eastern half.
- 2. The average size of bushes found on the west half, 1.8 feet of live stem, was much larger than the average size of bushes found on the east half, 1.07 feet of live stem.
- 3. The largest number of Ribes bushes occurred in the E-SE octant. Nearly half of the total number of Ribes bushes were found on 12.5% of the area. However, these were small bushes, averaging less than .67 feet of live stem. The total live stem on this octant was practically the same as that on the N-NE octant, with less than half the number of Ribes bushes.

Table 53 shows the number of bushes and feet of live stem of Ribes found in 1923 and 1924.

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Comparison of Ribes Found 1923 and 1924 by Quad	rants
: :Ribes Found 1923: Ribes Found 1924	:Percent of Efficiency
: No.: Feet: of: Ft. live: No: Feet of : Ft. live	: By : By
Quadrant: :live :stem per: :live :stem per	:number : Feet of live
: : stem. : bush : : stem : bush	
N.E. :1484:17294.2: 11.65:24: 43.9: 1.83	
S.E. :1857:13045.0: 7.03:41: 25.9: .63	: 97.84 : 99.81
	: 98.61 : 99.74
N.W. : 803: 7324.4: 9.12: 9: 5.3: 5.59	: 98,89 : 99.93
Total :4784:48012.7: 10.03:83: 102.0: 1.23	: 98.29 : 99.79

An examination of Table 53 shows the following conditions:

- l. the percent of efficiency is not strictly a true statement of efficiency. The comparison is made between Ribes found in 1923 and 1924, and not as they were in 1923. Included in the Ribes found in 1924 are several seedlings which came up since the spring of 1923. The feet of live stem of all bushes found in 1924 were considered as they actually existed in 1924, and were not discounted back to the 1923 basis. This fact would tend to raise somewhat, the percent of efficiency.
- 2. Owing to the small size of Ribes found in 1924, the percent of efficiency is approximately $l_{\overline{z}}^{\frac{1}{2}}$ % higher by feet of live stem than by number of Ribes.
- 3. There is a direct relationship between the number, and feet of live stem of Ribes found in 1923 and 1924. In each year the number of Ribes found was greatest in the S.E. Quadrant; next greatest in the

An examination of Table 52 shows the foll ing conditions:

- 1. By fer the greater number of Pibes found in 1924 occurred in the eastern half of the area. 85% of the total Ribes locations; 78% of the total Ribes bushes; and 68% of the total live atem was found in the eastern half.
- 2. The average size of bushes found on the west half, 1.8 feet of live stem, was much larger than the everage size of bushes found on the east half, 1.07 feet of live stem.
- 3. The largest number of Ribes bushes occurred in the E-SE octent. Nearly half of the total number of Ribes bushes were found on 12.5% of the area. However, these were small bushes, averaging less than 57 feet of live stem. The total live stem on this octent was practically the same as that or the N-NP octant, with less than half the number of Ribes bushes.

Table 53 shows the number of bushes and feet of live stem of Hibes found in 1923 and 1924.

TAELS LIII

	etnet	theup yd !	end 1921	s Found 1923	rison of Riber	Compa
of Efficiency	: Forcent	1/201	es Found	od 1923: Ril	:Ribes Fow	*
By	: Ey :	Ft. live	: in tes	t. live: No: Fe	To.: Teet: of: F	X :
Feet of live						
					d: .mete:	
					:84:17294.2:	
		-	: 6.53		57:13045.0:	
47.66	: 98.61:	2*98	: 6.93	16.17:9:	:1.84501:04	
99.93	: 98.39:	.59	2.3.:	9.12:9:	:4.4251 :50	A PRODUCTION OF THE PROPERTY O
99-79	: 98.89 :	1.23	: 0.501	10.07:83:	:1.210sh: 18.	TH: IstoT

An examination of Table 53 shows the following conditions:

- 1. the percent of efficiency is not strictly a true statement of efficiency. The comparison is made between Ribes found in 1923 and 1924, and not as they were in 1923. Included in the Ribes found in 1924 are several seedlings which came up since the apring of 1923. The feet of live stem of all bushes found in 1924 were considered as they actually existed in 1924, and were not discounted back to the 1923 basis. This fact would tend to raise somewhat, the percent of efficiency.
- 2. Owing to the smell size of Ribes found in 1924, the percent of efficiency is approximately la % higher by feet of live stem than by number of Ribes.
- 3. There is a direct relationship between the number, and feet of live stem of Ribes found in 1923 and 1924. In each year the number of Ribes found was greatest in the S.R. Quadrant; next greatest in the

N.E. Quadrant; next largest in the S.E. and S. W. Quadrants; and least in the N.W. Quadrant. The average size of Ribes found each year was largest in the S. W. Quadrant, next largest in the N.E. Quadrant; and smallest in the other two Quadrants.

TABLE LIV

Compar		Eradication				
	Ribe	s Found 123:	Ribes	Found 121	: Percent of	f:Efficiency, 1923
Ribes	:Numbe	er: Feet of :	Number	:Feet of	:By Number	: By Feet of Live
Species	:	:Live Stem:		:Live Sten	n:	:Stem
R, sang.	: 4187	: 40240.4	62	: 69,8	98.54	: 99.82
R. lac.	: 555	: 7517.8 :	20	: 31.2	: 96.52	: 99.59
G. divac.	: 35	: 243.0 :	(Markagan space	:	: 100.	: 100.00
R. Bract.	: 11	: 11.5 :	1	: 1.0	: 91.67	: 92,00
Total Ribes	s:*4788	:48012.7	83	: 102.0	: 98.30	: 99.79

*It may be noted that the total of Ribes found in 1923 by species is 4 bushes more than the total by Quadrants in Table 53. This is the results of an error in the 1923 Report. It is thought that 4788 is the correct total.

The following points may be observed from an examination of Table 54:

- 1. No G. divaricate was found in 1924. G. divaricate grows erect. The leaves are close to the stem and give the impression of growing in bunches. The plant is quite distinct from other deciduous growth.
- 2. The next highest % of efficiency was found in searching for R. sanguineum. The leaves of this Ribes are darker green in color than other deciduous growth resembling it. R. sanguineum grows upright.
- 3. The third highest efficiency securred in searching for R. lacustre. This Ribes has a tendency to creep along the ground, and spread by "layering". It was difficult for this reason to be sure that the whole plant was destroyed. Also, R. lacustre leaves resemble in color and texture the leaves of Acer circinatum, the vine maple.
- 4. The lowest percent of efficiency occurred in searching for R. bracteosum. Altho this percent of efficiency is based on only 12 bushes, yet it is believed that the efficiency would be low regardless of the number of bushes, if eradication is done in the spring. R. bracteosum is very tardy in putting out leaves. Consequently it is difficult to see among deciduous growth already well leafed out. In 1923 9 out of the 11 R. bracteosum were found the third time over the area.

N.T. Quadrant; next largest in the S. . sud S. . . quadrants; and least in the N.W. Quadrant. The average size of libes found each year was largest in the S. L. Quadrant, next largest in the N.F. Quadrant; and smallest in the other two Quadrants.

TAPLY LIV

				,	The same of the same of	4, 100		
, meiler,	by Hibes sy	T (20	I bas Es	in 198	tion	solbara	ison of	Compar
Efficiency, 1923	Percent of:	: 173	Tonna 1	Ribes I	:531	Found.	: Ribes	
By Feet of Live	By Number :	9	Teet of	Tumber	: 10	: Feet	: Numb:	Ribes
Stem	*	: 1119	Live St		tem:	:Live S		Species
\$8.66	: 46.86	1	8.20 :	Sõ	: 1	1.041204:	: 4187	R. sang.
99.59	96,52	*	31.8	OS	: 8	: 7517.8	: 555	R. 1.ec.
100,001	100.	2	one and that	Approximation of the contract	: (: 243.0	: 35	G. divac.
60*36								E. Bract.
99.79	98,30	1	0.501	83	: 5	:48012.	8874*:8	Total Riber

*It may be noted that the total of Ribes found in 1923 by species is 4 bushes more than the total by Quadrants in Table 53. This is the results of an error in the 1923 Report. It is thought that 4788 is the correct total.

The following noints may be observed from an examination of Table 54:

- 1. No G. divericate was found in 1024. G. divaricate grows erect. The leaves are close to the stem and give the impression of growing in bunches. The plant is quite distinct from other deciduous growth.
 - 2. The next highest % of efficiency was found in search nor for R. sanguineum, The leaves of this Ribes are darker green in color than other deciduous growth resembling it. R. sanguineum grows upright.
 - 5. The third highest efficiency securred in searching for B. lecustre. This Ribes has a tendency to creep along the ground, and spread by "layering". It was difficult for this regson to be sure that the whole plant was destroyed. Also, R. lacustre leaves resemble in color and texture the leaves of Acer circinstum, the vine maple.
- 4. The lowest percent of efficiency occurred in searching for R. brectosum. Altho this percent of efficiency is based on only 12 bushes, yet it is believed that the efficiency would be low regardless of the number of bushes, if eradication is done in the spring. R. bracteosum is very tardy in putting out lesves. Consequently it is difficult to see among deciduous growth already well leafed out. In 1923 9 out of the large correcteosum were found the third time over the area.

Table 55 gives a comparison of the average sizes of Ribes species found in 1923 and 1924.

TABLE LV

For High San A	Average Siz	es of Ribe	es Species	Found.	
			ge Size bushes: Average size of bushes found in 1924. :1924 as they were probably at t: Feet of :end of 1923 growth.) :Live Stem :Height (Ft.): Feet Live Stem 3 : 1,13 : .6 : .96		
R. seng.	9.61	•73	1, 13	, 6	.96
R, lac.	13.55	.76	1.56	.47	1.12
G. divec.	6.94		and sen		_ :
R. bract. Total Ribes	1.05	.g .74	1.0	• 75 • 58	,9 1,02

An examination of Table 55 shows the following points:

- 1. The average feet of live stem of Ribes found in 1923 was nearly 9 times that of Ribes found in 1924.
- 2. The average size of bushes found in 1924 as they were probably at the end of the 1923 growing season was approximately one tenth the average size of bushes found in 1923.
- 3. It is probable that the bushes found in 1924, were still smaller at the time of eradication in the spring of 1923.

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Table 56 shows the circumstances regarding the finding of each Ribes in 1924.

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Table 55 gives a comparison of the overege sines of Ribes species found in 1923 and 1924.

						VI 3	ABL	gr .			
		* Ž	aucT.	ресіея	bes S	of Ri	zes	egn Si	AVer		
ushes found	ine of b	rege s	ovA:	bushes	Size	verage	A:	998	TOVA :		
probably at	dey were	S as F	:192	. 4	n 192	i banc	7:8	. Ribe	B.I.E:	Ribes	
.ជ	FS grows	of 193	:ead	lo j	eef:	ingie	H:	CL	: Found	Species	
Live Stem	t.):Fret	I) Jin	:Hei	e Stem	vř.I;	(teet)	:(:		:1923		
96.	*	0.	* 1	1,13	;	27.	*	9,61	b 7	seng.	+11
	*		*		*		0 b		\$		
SILI	3 4	111	9	1.50	7	.76		13.55	7 0	180.	R.
	8		*		:		*		;		
15 Maria	*	general clubs	3	-700 0000	<u>s</u>	,—mar elses	;	ग्6.9	:	divac.	(C.,
	4		**		:		*		:		
0,		CT	*	1.0		.8	A b	1.05	4	.fostd	+13
50.1	*	-55	3 3	1.23	# #	47.	1	10.03		eel Ribes	OT

An exemination of T ble 55 shows the following coints:

- 1. The average feet of live stem of Ribes found in 1923 was nearly 9 times that of Ribes found in 1924.
- 2. The sverage size of bushes found in 1924 as they were probably at the end of the 1923 growing season was approximately one tenth the sverage size of cushes found in 1923.
 - β_* It is probable that the bushes found in 1924, were still smaller at the time of eradication in the apring of 1923.

Table 55 shows the circumstances regarding the finding of each Ribes in 1924.

TABLE LVI

Classif	ication	of R	ibes Found	1924 as to	Their Ex	istance	in 1924.	
	:Locat	ions:		Number	of Bushes			
Ribes	: :	: :	Bush	:Roots not	:Seed-:	Seed-: Bu	shes 4	:
Species	:Type	:No.:	Pulled 192	3:Pulled	:lings:	lings:ye	ars old	:Total
THE REAL PROPERTY.		: :	Alive 1924	:1923	:1924 :	1923 :an	d over.	
R. sang.	:New	: 18:	West .	•	(m0a)	5:	18	: 23
	:01d	: 10:	5	: 23	: 2:	9:	page in the	: 39
	:Total	: 28:	5	: 23	: 2:	14:	18	: 62
R. lac.	:New	: 4:		0 mm-u-17	0 0 0 0		14	: 4
	:Old	: 7:	7	: 7	-::	2:	p=1a	: 16
	:Total	: 11:	77	: 7	: !	2:	14	: 20
R. bract.	:New	: 1:	(and and	0 mag-relli 0	::		1	: 1
Total Ribe	s:New	: 23:	***	• manifes		5:	23	: 28
	:01d	: 17:	12	; 30	: 2:	11:		: 55
		40:	12	30	: 2:	16;	23	: 83

Explanation of terms:

The term "Location" is an area not greater than 4 feet in diameter on which Ribes occur.

The term "New" location means that it was not found in 1923.

The term "Old" location means that it was found in 1923, and supported Ribes growth in 1924.

Attention is called to the following points in Table 56:

- 1. Practically 60% of the total locations where Ribes were found were locations not found in 1923.
- 2. Only 36% of the R. sanguineum locations were old locations; while 64% of the R. lacustre locations were found in 1923. This fact suggests that R. lacustre is more difficult than R. sanguineum to permanently eradicate.
- 3. There were 1.2 bushes per new location, and 3.2 bushes per old location.
- 4. Of the bushes found on the old locations, 76% were grown either from roots left in the ground when the original bush was pulled in 1923, or from a portion of the original bush pulled and fallen on the ground and taken root again.

IVI BASAT

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in look.	Existance	to Their	1991 as	Ribes Found	to goites	Classiff;

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:	Bushes H	Seed-:	Seed-:	Roots not :	I: d	aus": :	: :	Ribes
istor:	bio erroy	linget!	linge:	: hello	led 1923:1	Ing: .ov:	:Type	Species
*	.Tavo bas	: [501	1924:	: \$283	: 1921 ov	iili: :	*	
ξS :	3.5	5:	\$ 2 mag	0 == ===	T pagetre	: 13:	:Mew	P. meng.
38	green commen	: 6	: 5	: 58	H Project	: IO:	:01d	
Sc :	13	1:1	: S	: ξS	: 3	: 28:	Intor:	
1	4.	1		9	\$,on_ lesio	:45 :	:Mew	R. lsc.
or:	Ann 1776	: S	3 p	: 5	: 5	: 7:	bIO:	
OS :	#	1 5	y on an	: 7	:	: 11:	:Total	
1	Ī.	*	*	2 and max	*	:1:	wew:	R. bract.
2 C :	(S	: 5	A more site.	g som man	-	: 23:	7971:3	Pot: 1 Ribe
: 55		: II	: 9	: 05	: SI	: 17:	:013	
: 32	23	: Cif	: S	: Οξ	: 31	:04	1	

Largenstion of terms:

The term "Location' is an area of greater than there in dismate on which Ribes occur.

The term "Wew" location means that it was not found in 192].

The term "Cld" location means that it was found in 1927, and supported Eibes growth in 1924.

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 - 4. Of the busies found on the old locations, 764 ere grown either from roots left in the ground when the original bush was pulled in 1923, or from a portion of the original bush pulled and allen on the ground and tegen root again.

5. 24% of the bushes found on the old locations were either 1923 or 1924 seedlings. Possibly the exposure and stirring up of the soil caused by the pulling of the original bushes caused the Ribes seeds lying under the bushes to germinate. If such was the case, it is to be expected that there will be other seedlings coming up from bushes pulled in 1923. Particularly is this true of R. sanguineum since 85% of the 1923 and 1924 seedlings growing on old locations were R. sanguineum seedlings.

1 -1

- 6. No Ribes four years old and over were found on old locations.
- 7. 82% of the bushes found on the new locations were four or more years old.
- 8. 44% of the R. lacustre bushes and 13% of the R. sanguineum bushes found on the old locations came from bushes pulled in 1923, which fell on the ground and grew again, either by layering, or the roots taking root again. This shows the ease with which R. lacustre starts again, and indicates that in order to ensure the complete death of the plant, it must be houng up securely and the dirt well shaken off the roots.

II Replacement of Planted White Pines Which Had Died.

In May, 1924, the missing planted white pines were replaced by white pines of the same age and source, Wind River Forest Service Experiment Station, Carson, Washington. The trees replaced were marked by aluminum tags labelled "1924".

Table 57 shows the number and percent of pines alive at different times.

- 5. 24% of the bushes found on the old locations were either 1923 or 1924 seedlings. Possibly the exposure and ctirring up of the soil caused by the pulling of the original bushes caused the Ribes seeds lying under the bushes to germinate. If such was the case, it is to be expected that there will be other seedlings coming up from bushes bulled in 1923. Particularly is this true of R. sanguineum since 85% of the 1923 and 1924 seedlings growing on old locations were R. sanguineum seedlings.
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Table 37 shows the number and percent of nines alive et different times.

TABLE LVII

	Mam hom	and Domonit a	f Dlante	A 1	Mhita Di	inos Alis	^	
-	the state of the s	and Percent o	AND THE RESIDENCE	-	The second distribution of the second distributi	CONTRACTOR OF THE PARTY OF THE	Е	
	:Total Pine	s:Checked	:Checked	L Ma	ay, 1924	:Pines	•	
Radius	:Planted	:Sept.15, 123	:Before	Re	olanting	g:Planted	:Checked	Sept. 15, 124
	:May 10,192	3: No. : %	No.	0	0	:May	: Number	: Percent
	:	:Alive:Alive	Alive	. 0	Alive	:1924	: Alive	: Alive
North	: 624	: 600 :96.15	589	:	94.31	: 35	: 605	: 95.95
N.E.	: 621	: 558 :89.86		:	89.21	: 67	: 599	: 96.78
East	: 622	: 598 : 96.14		:	95.82		: 609	: 97.91
S.E.	: 6314	: 572 :90.22			89.12		: 616	: 97.16
South	: 564	: 542 :96.13		-	95.04	: 28	: 563	: 99.82
S.W.	538	: 429 :79.74			76.39	: 127	: 504	: 93=68
West	: 562	: 462 :82.21			76.69	: 131	: 514	: 91.46
N.W.	: 598	: 519 :86.79	the same of the same of the same of	Openior record	84.45	the same of the sa	: 542	: 90.64
Total	: 4763	:4280 :89,86	4187	1 8	87.91	: 576	: 4552	: 95.57

Most of the pines missing September 1924, were those planted in May, 1924. The time of planting was very dry, followed by a hot summer.

The man detailed to patrol the area for fire cleared out around each tree to prevent possible shading out by ferns and other growth.

III Patrol of Area for Fire

On May 24, 1924 fire broke out on the holdings of the Cheakamus Lumber Company, about one mile northwest of the plot, on the east side of Squamish River. This was accompanied by a strong south wind. If the wind had been from the north, very probably the plot would have been burned over. This fire spread to rocky, inaccessible hillsides on the east side of Squamish River, and was not reported out until the latter part of August, 1924.

A man was detailed and paid by this office from June 1 to September, to guard the plot from fire. The following instructions were issued him:

"Fire patrol: patrol area for fire with shovel, Cheekye to Lake Alice; Lake Alice, Brackendale trail; road, Brackendale to Cheekye, every hot, dry day, and particularly on Saturday, Sunday, and Monday. Keep sharp lookout for small fires starting from matches or cigarettes. If possible, get name of offender and report same to Fire Warden MacKay, at Brackendale.

"Meet and get acquainted with District Ranger Sweetman, at Squamish. Learn all you can concerning methods of fire fighting from MacKay and Sweetman. Sweetman will supply you with badge and authority.

TABLE LYII

White Fines Alive	of Planted	and Percent	Number :

			:	ines	T::	ASSI 'As	3M	begined	ed :	:Check	al Pines	foT:
151, 21. ta	Se	Recked	1:5	lante	9:3	saitasio	Re	efore	15,123:1	.sept.	nted	Radius:Fla
Percent	:	Number	3	v.s	M:	00	:	No.	: 00:	* ON :	10,1923	yaw:
Alive	:	Alive	1	426	1:	OVIIA	3	Alive	:Alive:	evila:		*
96.95	:	605	*	35	4 6	15.46	7 8	589	:95.15:	009:	4129	: dfrou
96.73	#	599		67	1	13.68	:	1/25	:89.86:	: 558	621	: .F.V
97.92	6	609	8	98	:	95,82	8	965	:96.14:	: 598	622	East:
97.16	8	616	2	69	:	59.12	*	565	:35.06:	STC :	634	S. M. :
99.82	:	563	2	28	9	95.04	*	536	:96.13:	SH2:	1195	South:
93.68	4.	405	*	121	9	76.39	9	411	:19.74:	624 :	538	* . W . B
94.16	÷	52.4	*	131	0 0	76.69	*	TEH	:58.88:	29H :	562	: ៩៨១%
40.05	*	SHS	* u	93	:	84.45	*	505	:86.79:	: 513	598	W. W. :
95.57		5524	:	576	:	87.91	di di	4187	:89.86:	0854:	+163	: Istom

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"Meet and get acqueinted with District Benger Sweetman, at Squamish. Learn all you can concerning methods of fire fighting from Mackay and Sweetman. Sweetman will supply you with badge and authority.

"Report any fire found, giving date, time of day, location, extent and cause if possible. Give these data to MacKay and at end of season send me a report of all such fires----"

During the course of the summer the fire guard discovered and put out two camp fires left burning by Cheekye people on August 22, 1924, at Lake Alice, approximately one mile east of the plot.

IV Inspection of Planted White Pines for Evidence of Blister Rust

The planted pines were carefully inspected in May, 1924, but no positive signs of blister rust were found. A few possible needle infections were noted to be studied later with reference to any positive signs of blister rust that might develop.

On October 18 and October 25, 1924, the planted pines were again carefully inspected for signs of blister rust, the results of which are shown in Table 58.

The blister rust infection found on a planted pine consisted in a circular discoloration at the base of a needle or around a needle scar.

The planted pine infections were examined by H.G. Lachmund of the Office of Forest Pathology and pronounced to be caused by blister rust.

"Apport any fire found, riving date, time of ey, location, extent and cause if possible. Give these date to lockry and at and of season cend me a report of all such fire---"

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TABLE LVIII
Planted Pine Infection October, 1924

		••	••	•• ••	• • • • • • • • • • • • • • • • • • • •	••	••	••	•• •	•• ••	•••	••	••	••••	1 43 C: 938	971: 634	: 7 ⁴ C: 469 :	: 62C: 383 : 24R:	• •	.: :Circum.	••	•	: W Radius : NW Radius	: October 25 : October 25
	• • •	••	••		• ••	••	••	••	•••	•• ••	••	••	••	••••	• •• •		• ••	:178C: 1220			:Pine:from	. No. Dist.	SW Radius	:October 18
N	• • •	••	••	•• •	• ••	**	••	••	•• •		••	••	••	•• •			98R: 657	87L: 578	: (Feet)	: Circum.:	:Pine:from	. No. : Dist.	S Radius	Tedoper To
· · ·	• ••	••	••		• ••	••	••	••	•• •	•	••	••	••	•• •	• •• •	1191: 706	:1141: 676	520: 304		a: :Circum.	:Pine:from		: SE Radius): October To
13 H 721 T		*(1790):1085	••	176c 1067	(1090): 659		: 94R: 563		80L: 479	: 70L: 419		: 67c: 401		50L 299	: 33R: 197	1237 : 300: 179	345 : 27R: 161	48 : 21C: 125	(Feet): : (Feet)	:Circum:: :Circum:	from :Pine:from	nce	NE Radius : E Radius	October 23: October 23:
		••	••	••••	• ••	••	**	••	•• (•• ••	••	••	••	••••	• •• (:2050:	(560)	1R : 0 :(8C)	:(Feet)	:Circum, :		No. :Distance:No.	••	October 25 : Uct

J)

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Note: Brackets around pine No., in Table 3d indicate that a possible needle infection was found on that tree in May, 1924.

* indicates that the tree abowed fresh nyonia.

On exemination of Table 58 the following conditions are shown:

- 1. There were 28 of inted white wine chowing blister rust in October. Thirteen trees or 46% of the total were fund on the east radius.
 - 2. Two trees near the center of the plot on the east radius, Pines No.'s 1790 and 185 R showed fresh pycnia.
 - 3. There is no concentration of pine infection near the circumference with a decrease towards the center of the plot.

In order to study the source of infection, the infected planted pines, and hibes found in 1924 were plotted on the Map of Checkye

Table 59 based on the Map of Cheekye shows the distance from the infected planted pine to the negrest Ribes on the plot found and pulled in 1924.

TABLE LIX Negrest Known Ribes to Infected Planted White Pines

I)

:Total Ribes :within 300 feet Feet :from Infected :Pines :Total :Total L.S. :Locations:F.L.S.	2 2 4 7	-80-111111	7.6 : 5 :14.2 - : 1 : 1.9 .4 : 1 : 4. .4 : 1 : 4.	6.7 : 2 : 6.7 1.5 : 2 : 5.3 1.6 : 2 : 1.6
Distances lines. O to 300 sations:	- I - a	יייי שנטן איין ווווו		
within Differ n Infected Whi DO to 200 Feet cations: nber :F.L.S.		11 1 1 1 1 1 2 22 2 2 2 2 2 2 2 2 2 2 2	1 6.6	1 .6:
R N	Circumference: 1 7.0		66.1	
Nearest Ribes : : Ave.: : : : : : : : : : : : : : : : : : : :	cumference 1: 3.5: 7.0 1: 1.0: 1.7 3: .27: 2.3		R. sang. 11: 4 6.6 R. sang. 1:1.0 1.9 R. sang. 1:1.0 1.9 R. seng. 1: 4 4	R. sang. 8: 35: 4.7 R. sang. 1: 6: 6 R. sang. 1: 6: 6
Distance di Direction Infected to Neares Known Rib	100 100 100 100 100 100 100 100 100 100	110 S.E. 123 S.E. 125 S.E. 190	195 N.E. 49 E. 224 S. 292 S.	:225 N.E. :201 N. :113 N.E. :213 V.
Ŋ	North LR N.E. 8C : 56C : 205C East : 21C	7.00	S.E.: 520 : 114L : 119L South: 87L : 98R : : 178C	#est: 620 740 971 11430 N.W.: 24R

Dute In antopical of a situation of a second

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An exemination of Table 59 shows the following facts:

- l. The shortest distance from infected planted pine to the nearest known Ribes was found to be 35 feet on the south east radius.
- 2. The greatest distance from infected planted pine to the nearest known Ribes on the plot was found to be 424 feet on the east radius.

In order to bring out certain points in Table 59, Tables 60 and 61 have been made.

Table 60 shows the directions from infected planted white pines to the nearest known Ribes on or off the plot.

TABLE LX

Analysis of Directions from Infected Planted Pines to
Circumference or Nearest Ribes on Plot.

		01100	M- 4	7 - 021		-	24 0	-	- 50	O Tre	-	90 0	44	6 de 1	7 0 0
Radius:	No. Planted	:Di	rec	tion	15	fro	m	Inf	e	cted	l	Pine	3	to	Nearest Ribes
	Pines Infec	ted:	N.	N. E	:	E.	: 5	E.	:	S.	3 5	5. W.	: 1	V.	: N. W. :
North:	1	: 1		-	- 3	mac	:	-	:	Gall (Sec.	:		:		•
N.E. :	3	: -	-> 8	1	:		:	1	•	1	:		: •		: :
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South:	2	:	5		:	-	2	State obuse	:	2	:		:	-	0
S. W. :	1	: -	- ;		:		:	1	:		:	eta err	: •	-	* mai *
West:	- 4	: 1		2	:	-	:	-	:	-	:	ate the	:	1	: :
N. W. :	1	:	- ;	-	:		:	-	:	-	:	-			: 1:
Total:	28	: 3	1	14	:	4	;	8	:	g	:	-	:	1	: 1:

An examination of Table 60 shows that in over 82% of the cases, the nearest source of white pine infections from the circumference or Ribes on the plot was from the north east, east, south east, and south, or from a general easterly direction, compared with less than 18% from a general westerly direction.

Table 61 gives an analysis of the different distances from known Ribes in which infection of white pines occured.

29

An examination of Table 59 shows the following facts:

- 1. The shortest distance from infected planted pine to the nearest known Ribes was found to be 35 feet on the south east radius.
 - 2. The greatest distance from infected planted pine to the nearest known Ribes on the plot was found to be 424 feet on the east radius.

In order to bring out certain points in Table 59, Tables 60 and 61 have been made.

Table 60 shows the directions from infected planted white pines to the nearest known Ribes on or off the plot.

Analysis of Directions from Infected Planted Pines to Circumference or Mearcst Ribes on Plot.

		80	C. m. 7	220	000	- W17 O	62 -7	4 300	2.4	40	120	1270 7		# 20 BO	440			
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	*	4	I-di pasa	0	-resulting	5		9	:	3	8	-manus	•		:	13	*	East
	*		data		villa puly	*		-	8 0	I	3	I		1	:	3	7	S. E.
	0	- 1	prop. 100m	*		: S	:	Printe service	6	profit return	:		F 4	-	:	S	:	South
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	: I	_ 1	1	*		8	9	8	9	17		11	3	3	1	28	9	Total

An examination of Table 60 shows that in over 82% of the eases, the nearest source of white pine infections from the circumference or Ribes on the plot was from the north east, east, south east, and south, or from a general easterly direction, compared with less than 18% from a general westerly direction.

Table 61 gives an analysis of the different distances from . known Ribes in which infection of white pines occured.

TABLE LXI

1)

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2

130

3 44 _ .~;

Number of Cases in which Nearest Known Ribes Were Found Within Given Distances from Infected Planted White Pines.

						-				
2 (5)	Number	:Numbe	er of Ca	ses in	Which	h Knov	n Ril	es We	re Found	:Average
Radius:	Pines	:with:	in Diffe	erent D	istan	ces fi	rom Ir	afecte	d White	: Distance
	Infected	l:Pine:	3. e	b 1 -	1700	7			7 01 have	:(Feet)
· / / / / / / /	11 6 12 12 13	: 50	100 :1	0 :200	:250	:300	:350	:400	: 450	:
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S.F.	.3.	: 2 :	-	: 1	***	*	2 man	-		: 93
South:	2	-	:		: 1	: 1	\$ among	· maun	* man are services.	: 258
S.W.	7 1 W.	3 S			: 1		-	3	:	: ,213
West :	4 4	10	(:]		: 3	2 mars	:			: 188
N.W.	1	:	ment (;	1	:	:	*	: 150
Total:	28	: 2	4 : 8	: 2	: 7	: 2		: 1	: 1	: 169

The figure of the contraction of An examination of Table 61 shows the following conditions.

- and the same of th 1. The greatest number of pine infections occurred within 100 to 150 feet from known Ribes.
- 2. The greatest average distance from infected white pines to known Ribes was on the south radius.

the state of the s Table 62 shows the number and feet of live stem of nearest Ribes to which pines on each radius were exposed.

The state of the s TABLE-IXII

10	*		Rib										
		:45° S	egment:	Ribes	on	:Ri	ibes o	utsi	lde	:		:No. P	lanted
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			Rad.										
	North _	:NSS.M	to:	15.:	15.0	* TI	40	1 12	846	: 55:	861.0	: 1	
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	S.E.	: S670E	to :	30:	19.4	:	8	:	138	: 38:	157.4	: 3	
		: S220E	4	:	V-12 77	2 -	Am	10 10	v.L.		232.2	1,	
47	South	: S220E	to:	3:	14.2		10	:	218	: 13:	232.2	: 2	
		:S230W		:		:		:		: :		:	
	S.W.	:S230W					2	•	16	: 3:	17.0	: 1	
		:568°W	*			:		:		: :		:	
	West	:568 W	to ;	15:	17.4	*	20	•	455	: 35:	472.4	: 4	
		:N67 W		*		:		:		: :		:	
	N. W.	:N67 W	to :	1910 mm ()	-	•	8	:	242	: 8:	242.0	: 1	
		:NSSOM	:	:	-	1		:	in the state of th	: :		:	
	Total	:	:	831	102.0	1	609	:	6007	:688:	6166.0	: 28	

TABLE IXI

Number of Osses in which Mearest Known Ribes Mere Found Within Given Distances from Infected Planted White Pines.

TO A PERSONAL PROPERTY OF THE PARTY OF THE P			Marine water or on	arteriore e e e de company e de la company	delicano estrucialente		grandler over etteration .	-		ALTERNATION AND ADDRESS OF	en - renn men rinnadenner	The same of the	edit over married supremous
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An exemination of Table 61 shows the following conditions.

- l. The great st number of pine infections occurred within 100 to 150 feet from known Ribes.
- 2. The greatest average distance from infected white pines to known Ribes was on the south radius.

Table 62 shows the number and feet of live stem of nearest Ribes to which pines on each radius were exposed.

TIXI TIXI					
	alls als	2530 40	prior 100	poly A	PIPI

							on contraction	all water CAS						
				Rid	890	LTA	fectin	g Each	Rad	ius				
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LetoT	*				58 3	TI	: 0,50	609	9	17009	:688:	105.0:	28	

An examination of Table 62 and Map of Cheekye shows the following conditions:

- l. The radius affected by the gretest number of Ribes around the circumference, the east radius, had the largest number of pines infected.
- 2. There were only 8.8 feet of live stem in the immediate vicinity of the east radius on the plot.
- 3. The above two statements would indicate that the Ribes on the circumference east of the east radius were largely responsible for the infection on the east radius.
- 4. The radii showing the least number of pine infections, the north, south west, and north west radii, had a relatively small amount of Ribes close to them. While there is 861 feet of live stem affecting the north readius, a glance at the map will show that the largest number of these Ribes occurred in the extreme north east corner of the segment.
- 5. Altho there was only a relatively small amount of Ribes, 157 feet live stem, associated with the south east radius, there were three pine infections. However, two were very probably caused by 1 R. sanguineum bush within 50 feet.
- 6. There is insufficient evidence on the number and location of Ribes surrounding the plot to warrant any definite conclusions as to the source of the planted pine infection.

Unknown Injury to Planted Pines

During the inspection of the planted pines for blister rust on Oct. 18 and 25, 1924, a peculiar injury was noted. This consisted in a distinct swelling from on to two inches in length just above the ground. Below the swelling was a construction of the same length. Samples of this injury were sent to the Office of Forest Pathology, where they were determined to be of physiological origin and not caused by blister rust. 90% of the trees so affected were dying.

Table 63 shows the number of planted pines on each radius affected by the unknown injury.

An examination of Table 62 and Map of Checkye shows the following conditions:

- l. The radius affected by the gretest number of Ribes around the circumference, the east radius, had the largest number of pines infected.
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Table 63 shows the number of planted pines on each radius affected by the unknown injury.

TABLE LXIII

Planted Pines Affected with Unknown Injury Radius :65 Number of Pines Planted 1923 1924 Total North 1 1 9 16 16 North East 2 2 5 East 555 54 South East South 1 5 4 South West 1 West 9 1 10 9 North West 111 47 Total

Two trees planted in 1923 on the west radius showed the unknown injury and also blister rust.

It appears from Table 63 that the trees planted in 1923 were most subject to the physiological injury.

V Analysis of Infection of Native Pines on the Plot.

In the fall of 1924 a study of the infections on the native pines was begun. Each pine was plotted, given a number, and tagged with that number. Each canker found was tagged. Data were taken according to the forms "Cheekye Plot" No. 1 and No. 2.

The purpose of this work was to put the native pines on the same basis as the planted pines, so that in future years infections on both planted and native pines could be studied and compared.

This work was not completed in the fall of 1924, and a further discussion of it will not be made in this report.

VI Topographic Survey of Cheekye Region

A topographic survey of the Cheekye region, using a Forest Service compass, slope chain, and Abney hand level, was begun in the fall of 1924. Strips were run every 10 chains and topography sketched in using a 10 foot contour interval. This work is not yet completed.

TARLE LXIII

Planted Pines Affected with Unknown Injury Number of Pines Planted Radius Total 1924 ESPI ſ ſ Morth 16 91 North East **つ**つつつ 5 Rest 15 South East I South 11 I South West OI I Mest North West Total

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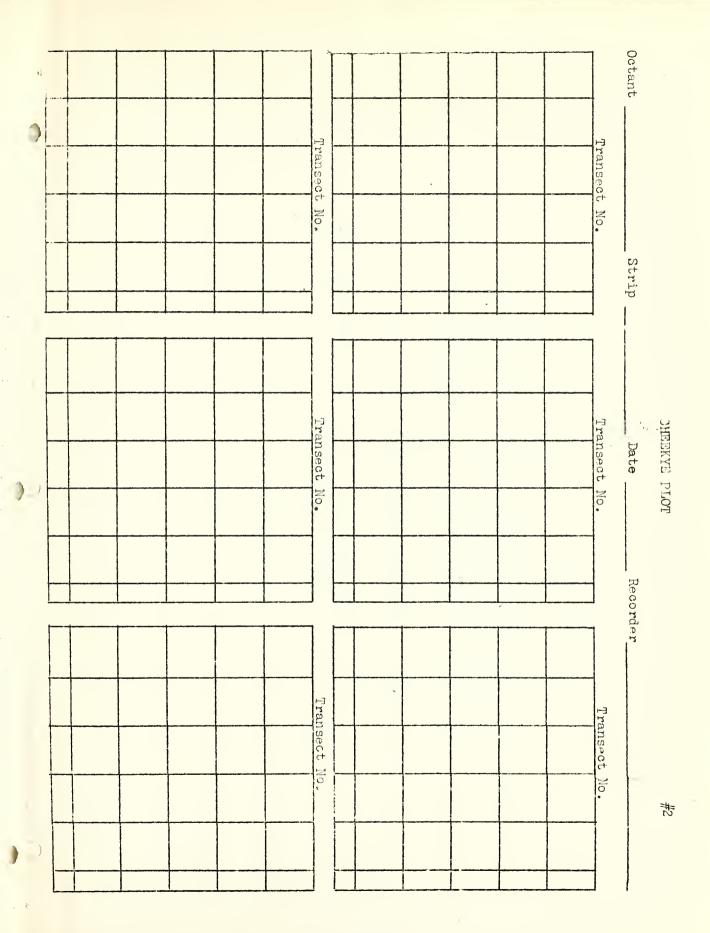
VI Topographic Survey of Cheekye Region

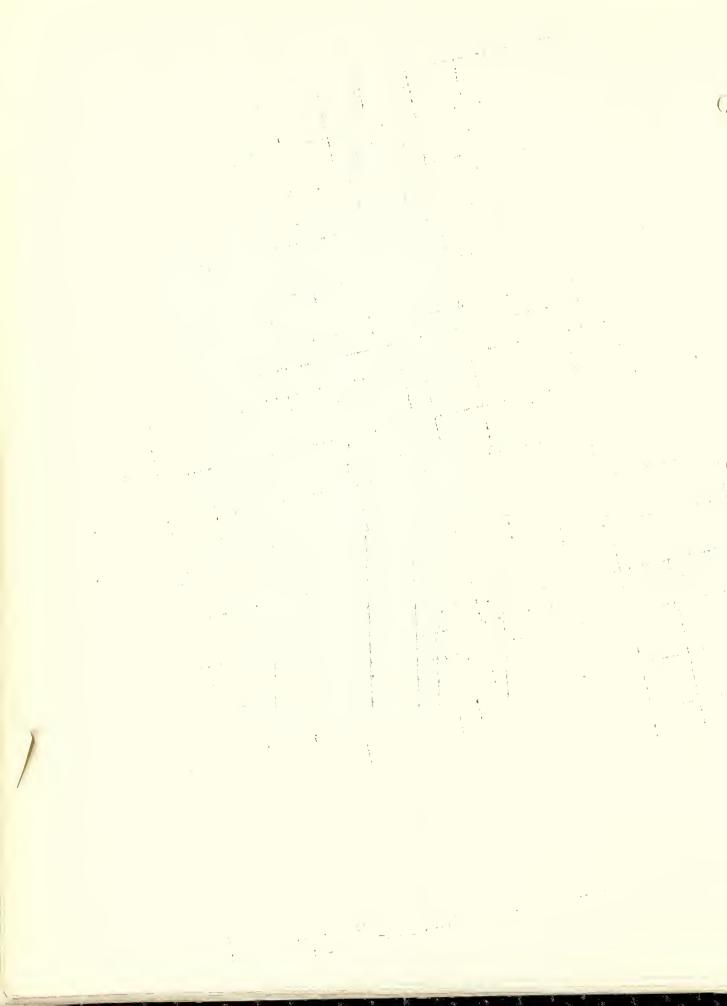
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CHEEKYE PLOT

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	: : : : : : : : : : : : : : : : : : : :		2. Location and eradication of caltive ted black currents, nursery inspection, scouting for the disease, and educational work,
	189.24:	\$31.67:	Montena,
	:61.801	• • • • • • • • • • • • • • • • • • •	Idaho,
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4	169.1:0;	2,712.96;	Viscellaneous,
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	: Cú · C56	: : : : : : : : : : : : : : : : : : :	4. inspection of nursery shipments for violations of blister rust quarentines in cooperation with Federal Borticultural Board
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C	: N. M. B. E. M.	: 14,463.53:	Est col

EXPENDITURES

WESTERN OFFICE OF BLISTER RUST CONTROL

January 1, 1924 to June 30, 1924.

	: S	ubelatence :			tamahdla Dantad	Complete :	:
Project	Salaries :	and : T Travel :	Requests :	Personal : Re	tomobile, Rented : ental : Operation :	Supplies,: Etc. ::	Total :
1. Scientific investigations of the disease,	\$ 574.00:	\$ 286.39:	\$ 6.66:	\$ 30.31	: :		\$ 897.36:
2. Location and eradication of cultivated black currents, nursery inspection, scouting for the disease, and educational work.				; ; ;	; ;	:	:
Montena,	831.67	189.24	55-49:	;\$ 1	151.61: \$ 44.31	\$ 6.35:	1,278.67:
Idaho,	:	108.19	202.48			5.75	316.42
Washington,	440.00	222,11	1.67:	181.44			845.22
Oregon,	: 1,246.00:	382.10:	33.50:	175.98:	:	34.00	1,871.58
Miacellaneous,	: 2,712.96:	169.40	133.55:	132.16			3,148.07
3. Control reconnaiseance and experimental local control, in the white pine forests of northeastern Washington, northern Idaho, and northweetern Montana,	3,743.50	722.73:	167.25:	1g.41:		78.40.	4,730.29
4. Inspection of nursery chipments for violations of blieter rust quarantines in cooperation with Federal Horticultural Board	1,795.00:	990.90	355.02:				3,140.92
5. Maintenance and miscellaneous expenses of western field office	1,620.80:					611.03	2,231.83
6. Supervictor	1,500.00	143,64	145g.31:				2,101.95:
Totel	: :\$14,463.93:	\$ 3,214.70:	\$ 1,413.93:	\$ 538.30:\$	151.61: \$ 44.31	\$ 735.53	20.562. <u>31:</u>

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1.11 Montana	:\$ 2,131.67:	\$ 1,156.41:	\$ 32.64:		\$ 350.00:	\$ 146.86: 299.85:	•	\$ 4,250.34: 3,194.79:
1. 12 Idaho	: 1,381.00:	1,157.29:	34.50: 17.77:		322.15: 200.00:	100.51;	:	4,463.51
1.13 Washington	: 1,855.16: : 2,520.44:	1,538.55: 2,017.86:	272.96:			100.51.	:	6,046.48
1.14 Oregon 1.15 California	: 1,560.67:	1,063.64:	251.79:			103.37:	\$ 2.10:	
1.2 Inspection of transported hoet plante, in	. 1,500.01.	1,000,007.	-5-171	J., J., J., J.,		:		
cooperation with Federal Rorticultural Bd.	1,888.49:	835.71:	37.26:	21.00		:	:	2,782.46:
1.3 Sanitation of nurseries.	:	:			:	:	:	
1.34 Oregon	: 433.34:	25.00:			:	:	:	458.34:
1.9 Public information and cooperation in	: :	:	:ر <u>ا</u>		:	:	:	mal, loc
delaying epread	: 666.67:	90.23:	47.56:		:	:	:	804.46
2.1 Testing and improving methods of control	:		;		•	· ·	39·95:	442.45
reconnaiseance	: 225.00:	177.50:				į	29.32:	446.47
2.2 Teeting and improving physical destruction	: 2,931.17:	1,608.71:	1.90	56.84		· ·	185.68:	4,784.30
of Ribee	: 5,9,1.1(:	1,000.71:	1.50,	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			,	,,,,
2.3 Testing and improving chemical destruction of Ribes	1,008.67	282.75:	42.32	250.32			118.96:	1,703.02
2.4 Ecological study of factors effecting local					:	;	:	
control	: 731.33:	591.15:			:	:	69.62:	1,392.10
2.9 Summarizing and making recults available	: 741.67:	;		:	: :	:	:	741.67
3.1 Control reconnaiseance on Federal lande.	:	:	:	:	: :	:	70.75	2 250 10
3.12 Ideho	: 1,340.00:	839.75:		•	:		79.35	2,259.10
3.2 Eradication of Ribes on Federal lande.	1	- o(a lib	00.50	55.44		į	1 169.08	17,897.96
3.22 Idaho	: 11,512.50:	5,061.44:	99.50	· 22• 44		;	1,10,100	. 1,,00,1.00
3.3 Control reconnaiseeance on private lands.	: 1,177.33:	11.80	•	•				1,189.13
3.32 Idaho	: 1,1(1,2);	11.50,		•			:	
3.9 Public information, demonstration, and service work.			'		:	:	. :	
3.92 Idaho	2,962.05:	689.69:	15.15	104.30	: :	:	11.58:	3,782.77
3.93 Washington	<u> 440.00</u> :	138.30:		:	: :	:	;	578.30
4.1 Progressive spread of rust.				: ,	:	1, 6 =1;	;	Cod od
4.11 Montana	: 308.33:	152.95:		: 21.56		46.14:		628.98
4.13 Washington	: 671.22:	540.04:	9.57	: 225.33		20.15:		1,490.02
4.16 British Columbia	: 309.99:	319.91:			: 176,43:	00.11:		2,031.79
4.2 Damage caused to pinee	: 1,258.17:	590.60:						2,372.28
9.1 Supervision	: 1,800.00:	176.39					521.54	
9.2 Maintenance of field office	: 1,951.00:	47.31:		:	:		132.53	
9.3 Miscellaneous supplies	:	75•39					- Je Je Je Je Je Je Je Je	:
	!!			:	:			
Total	:\$41,805.87:	\$19,188.37	\$1,663.12	: \$3,594.70	:\$1,494,44	\$776.99	\$2,330.39	:\$70,853.88

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			1.1 Cultivated black current location and eradication in cooperation with states.
	\$ 1,155.41: 1,157.29: 1,538.55:	:\$ 2,131.67: : 1,331.00: : 1,855.16:	1.11 Montana 1.12 Ideho 1.13 Washington
	2,017.56:	: 2,520.44: : 1,560.57:	1.14 Oregon 1.15 California
	835.71:	1,838.49:	1.2 Inspection of transported host plants, in cooperation with lederal Porticultural Ed. 1.7 Sanitation of nurseries.
	:00.38	. १५३.३५:	1.5 Santastion of markeries. 1.34 Oregon 1.9 Public information and cooperation in
	90.23	666.67:	delaying spread 2.1 Testing and improving methods of control
	177.50:	:00.889	reconnsisence 2.2 Testing and improving physical destruction
	1,603.71:	: 2,931.17:	of Ribes 2.3 Testing and improving obemical destruction
	: 27.253	1,008.67:	of Ribes 2.4 Mcological study of fectors offecting local
	591.15:	731.33:	control 2.9 Summarizing and making results available
	:37.022	: 1,540.00:	3.1 Control reconnaissance on scderal lands. 3.12 Idaho
	5,761.44:	: 11,512.50:	3.22 Hradicstion of Mibes on Federal Lands.
9	11.50:	1,177.33	3.3 Control recommissence on private lands. 3.32 Idaho
	689.69	2,962.05:	3.9 Public information, demonstration, and service work. 3.92 Idaho
	138.30:	:00.044	3.93 %shington 4.1 Frogressive apread of rust.
	152.95: 510.04:	: 306.33: : 671.22:	4.11 Lontena 4.13 Lashington
	319. pl: 590. 50:	309.99:	4.16 British Columbia 4.2 Damese caused to pines
	176. 39: 17.31: 75.39:	1,851.20:	9.1 Supervision 9.2 Maintenence of field office 9.3 Miscellaneous supplies
, <u>I</u> .	\$19,188.37:	: \$41,605.87:	